MEMORY AND ATTENTIONAL BIASES ASSOCIATED WITH PERFECTIONISM: THE IMPACT OF MOOD AND THREAT RESPONSIVENESS

by

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Abstract

Research has argued that perfectionism, as well mood state, can serve to influence the type and amount of information that will be attended to and remembered in one's surrounding environment. The purpose of the current study was to look at how mood and differing degrees of threat may influence the cognitive processes of individuals higher in perfectionism. Following completion of the perfectionism measures, 121 post-secondary students were exposed to a mood induction as well as a threat condition and then asked to complete three cognitive tasks – d2 test of attention, emotional Stroop, and a recognition task. Results indicated that perfectionism was associated with accuracy and reaction time and this impact differed based on mood and threat. Results also indicated individuals higher in perfectionism had a memory bias towards negative and perfectionistic content, reinforcing the idea that perfectionism has a distinctly cognitive component that impacts how an individual processes incoming information.

Keywords: perfectionism; attention; memory; mood; threat

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Memory and Attentional Biases Associated with Perfectionism: The Impact of Mood and Threat Responsiveness

In day-to-day life, mood serves to influence the ways in which an individual perceives his or her surrounding environment and, more specifically, impacts on how an individual is able to process incoming information (Becker & Leinenger, 2011). Studies have demonstrated that if an individual is induced into a negative mood, they are more likely to pay attention to and remember negative incoming content, as opposed to positive or neutral content (Wadlinger & Isaacowitz, 2006). This is termed an attentional and memory bias in that one's mood state directly influences the type and amount of information that will be attended to and remembered. Research has further proposed that certain personality constructs can also serve to impact on one's cognitive resources by either assisting or inhibiting one's ability to attend to and remember information (Szalma, 2009). This process could result in an attentional or memory bias. Considering the results of previous research studies, it is worth considering if such a bias could be exacerbated by mood state. Specifically, one of the personality constructs that has been suggested by the literature to create such an attentional or memory bias is perfectionism (Besser, Flett, Guez, & Hewitt, 2008). Therefore, the purpose of the current study is to provide additional insights into the cognitive processes of individuals with differing levels of perfectionism. More specifically, the current study seeks to look at how mood influences the attentional and memory processes of these individuals and whether or not a bias towards perfectionistic content exists and how such a bias is influenced under differing degrees of threat.

Studies have proposed that when an individual measures higher in perfectionism, they are more likely to be cognitively attuned to perfectionistic content (Besser et al., 2008). While experimental research in this area is limited with only a few studies examining this issue (Besser

et al., 2008), it can be argued that a bias towards perfectionistic content could be influenced by one's mood state and, furthermore, be influenced by whether or not that mood state is positive or negative. In order to understand how it is that mood may impact on the attentional processes of individuals with differing levels of perfectionistic cognitions, it is important to examine which processes comprise attention.

Attention

Attention is the manner by which an individual processes pertinent incoming stimuli, all the while filtering out large amounts of extraneous and irrelevant information (Bates & Lemay, 2004). Attention is an active process in that the individual must be able to selectively attend to the relevant information being presented and, to do so successfully they must be able to dedicate enough cognitive resources towards searching, focusing and maintaining attention (Bates & Lemay, 2004). Bates and Lemay (2004) suggested that the construct of attention is comprised of multiple processes, all of which combine together in order to maintain one's attentional processes throughout a cognitive task. The ability to dedicate enough cognitive resources towards the aforementioned processes is crucial for overall cognitive performance. This would then suggest that the ability to filter out task-irrelevant or distracting information is a critical attentional process and any deficits in this ability would thereby compromise overall cognitive performance.

In a study by Dai and Feng (2009), it was discovered that individuals diagnosed with major depressive disorder (MDD), when presented with a cue-target attentional task, were unable to disengage their attentional resources from incoming irrelevant stimuli thus resulting in performance deficits. More specifically, when presented with negative emotional stimuli that were irrelevant to the task, individuals diagnosed with MDD were unable to inhibit this

information from entering their cognitive resources, which resulted in longer reaction times compared to the healthy controls (Dai & Feng, 2009). This study lends support to the idea that if an individual is not able to disengage their attentional processes from irrelevant information, in this instance negative emotional stimuli, then their ability to process further incoming information may be limited, compromising subsequent task performance. This was further demonstrated in a study completed by Desnoyers and Arpin-Cribbie (2013).

Preliminary findings from Desnoyers and Arpin-Cribbie (2013) suggest that the degree to which one is able to inhibit irrelevant information from entering one's attentional resources is critical to task performance. Using a selective attention task, it was found that individuals higher in perfectionism had an increased number of errors related to attention and inhibitory control when compared to individuals lower in perfectionism. These findings suggest that, when presented with the attentional task, individuals higher in perfectionism had a harder time focusing their attention on the presented stimuli and as such were unable to keep task-irrelevant information from interfering in their ability to cognitively process the information. Consequently, this process resulted in an increased number of errors for those higher in perfectionism and further suggests that being able to filter out extraneous information is critical to successfully performing a cognitive task.

Mood and its Impact on Attention

Beyond the potential influence that attention may have on cognitive performance, it is also important to understand how one's mood state may interact with attention to further impact on one's cognitive resources. Mood can be defined as one's emotional state and research on its interrelatedness with attention has examined what occurs to an individual's attentional processes when they are placed into either a positive or negative mood state (Becker & Leinenger, 2011).

According to Fredrickson (1998), when an individual feels a positive emotion such as joy or contentment, their attentional resources are expanded or broadened. This theory is known as the *broaden-and-build theory* and Fredrickson (1998) suggested that positive emotions temporarily broaden an individual's thought-action schemas such that their ability to cognitive process incoming stimuli is increased and their attentional resources are expanded. It is further proposed that when an individual is in a positive mood they have an increased attentional capacity to seek out and discover new experiences that are congruent with their current mood state which serves to further perpetuate their positive mood (Burns et al., 2008; Fredrickson, 1998; Wadlinger & Isaacowitz, 2006). Conversely, Fredrickson (1998) suggested that when an individual feels a negative emotion such as fear or sadness, rather than being broadened, one's attentional resources are constricted such that the individual selectively focuses on the negative emotions that are being elicited. It is argued that this may be linked to the innate fight or flight response in that this attentional constriction limits the individual's attentional capacity in such a way that only salient negative stimuli are being perceived and subsequently cognitively processed, allowing the individual to act quickly and in a life-preserving manner (Fredrickson, 1998).

Wadlinger and Isaacowitz (2006) demonstrated this broadening attentional effect in a study involving mood induction, eye tracking methodology and a visual attention task. It was discovered that participants who were induced into a positive mood, when presented with emotionally valenced images, were more likely to attend to images of a positive emotional tone even when they were located in their periphery, when compared to participants who were induced into a negative mood. Specifically, when compared to those induced into a negative or neutral mood, participants induced into a positive mood had an overall higher percentage of gaze fixation durations to the presented stimuli when it was located outside the main perceptual field

and when that stimuli was of positive valence. The authors contend that this demonstrates a broadening attentional effect in that when individuals were placed into a positive mood, they more effectively attended not only those salient positive cues in their immediate attentional field but also to those in the surrounding field. The authors further suggested that this attentional effect is more likely to occur when the presented stimuli are congruent to that of the individual's emotional state due to the fact that individuals have an innate need to perpetuate their positive mood and as such will only attend to those salient features that will serve to do so (Wadlinger & Isaacowitz, 2006).

Although research suggests that when an individual is in a positive mood their attentional resources are broadened, research has also demonstrated how a negative mood impacts on an individual's cognitive processes. In a study by Chepenik, Cornew, and Farah (2007) it was noted that, when presented with a memory task, individuals induced into a sad mood showed a preferential bias towards negatively valenced content in that they recalled more words when the content was of this emotional valence. Chepenik et al. (2007) contend that such a result further reinforces the fact that, when induced into a negative mood, the cognitive processes of an individual are restricted in such a way that the types of information they are able to process becomes negatively biased thereby facilitating increased recall for negative words. The finding that one's attentional resources are constricted by one's mood state is consistent with those of Wadlinger and Isaacowitz (2006) and further lends support to the idea that mood plays a key role in the types of information one attends to and remembers.

Mood Congruency Hypothesis

When looking at why, when induced into a negative or positive mood, individuals show a preferential bias towards specific emotionally valenced content, it is important to examine the

mood congruency hypothesis. The mood congruency hypothesis suggests that individuals have an easier time retrieving information from their memory when that information is congruent or similar to their current mood state (Rusting, 1999). Consistent with the mood congruency hypothesis, previous research has demonstrated that individuals are more likely to recall positive memories when they are in a positive mood but when in a negative mood, individuals are more likely to recall memories that are negatively valenced (Rusting, 1999). The mood congruency hypothesis, whereas it is often applied to one's memory processes, can also be extended to one's attentional processes. In regards to one's attentional processes, the mood congruency hypothesis proposes that an individual will more selectively attend to information when it is representative of their current mood state (Becker & Leinenger, 2011). It is further suggested by these authors that one's emotional state creates a cognitive filter thereby constricting the cognitive resources one has available and therefore limiting the content and the degree of the information the individual is able to attend to and remember. Such a filter acts to block out incoming stimuli that is of a different emotional tone and helps explain why recall of information seems dependent upon one's current mood state (Josephson, Singer, & Salovey, 1996).

In a study completed by Becker and Leinenger (2011) it was discovered that when participants were given an attentionally demanding task, only the information that was emotionally congruent to their current mood state was attended to and subsequently processed for further use. Using an inattentional blindness paradigm in which participants were asked to attend to presented stimuli all the while filtering out extraneous stimuli, Becker and Leinenger (2011) demonstrated that when participants were visually presented with extraneous stimuli that were congruent with their current mood state (happy, sad or neutral), more attentional resources were dedicated towards said stimuli and away from the required task resulting in higher rates of

mood congruent stimulus detection. These authors contend that when presented with stimuli that are mood congruent, due to the high emotional salience, one's attentional resources are captured subsequently impacting on the ways in which they process further incoming information (Becker & Leinenger, 2011). Similar results have also been found in studies involving individuals higher in depressive symptomology (Dai & Feng, 2011; Sharma, Nair, & Khess (2011).

Dai and Feng (2011) noted that individuals who measured higher in depressive symptomology when presented with the emotional Stroop task (asked to respond solely to the color ink of the word while filtering out the meaning of the presented word), had slower reaction times when presented with the negative as opposed to positive or neutral content. The authors argue that such a result indicates an attentional bias towards negative content. Participants' task performance was compromised when they were presented with the negative words, such that those higher in depressive symptomology were unable to keep the meaning of the negative words out of their cognitive awareness and took longer to respond to the color ink of the word. It is further suggested that such an attentional bias may be due to the fact that individuals higher in depressive symptomology selectively attend to information that is congruent, in this case negative, as opposed to incongruent with their particular mood state impacting on their ability to complete the task successfully (Besser et al., 2008; Dai & Feng, 2011).

The results of the previously described study suggest that when presented with the negative words, because they were congruent with their current mood state, individuals higher in depressive symptomology were unable to disengage their attentional resources from the content of the word subsequently increasing their reaction time when compared to the positive or neutral words (Dai & Feng, 2011; Sharma et al., 2011). If an individual is cognitively attuned to mood congruent information, as these studies would suggest, this would serve to perpetuate their

current mood state as only negative information becomes cognitively salient and therefore more accessible and positive or neutral information is not perceived (Dai & Feng, 2011; Sharma et al., 2011). This would also cause reactions times to increase when individuals are presented with information that they find to be personally threatening as they are unable to filter out this emotionally relevant information impacting their overall task performance. These findings thereby support the mood congruency hypothesis in that information that is congruent to an individual's mood state is highly accessible and more likely to be attended to and recalled suggesting that one's cognitive ability to process incoming stimuli differs based on one's current mood state.

Hewitt and Flett's Tripartite Model of Perfectionism

Research has further proposed that the way in which personality constructs interact with one's mood state can impact on the amount of cognitive resources one is readily able to call upon, thereby impacting on one's overall attentional and memory processes (Besser et al., 2008; Szalma, 2009). One of the personality constructs that has been suggested to impact upon one's cognitive processing, and more specifically on one's attentional or memory processes, is perfectionism. One of the ways in which perfectionism has been conceptualized by previous literature proposes that it can be characterized by the high personal standards that one sets for his or her self as well as for those individuals who surround them (Chang, 2006). A model that has been proposed and supported by previous literature is that of Hewitt and Flett (1991) who argue that perfectionism contains both a personal as well as a social dimension, and that each dimension may contribute to a degree of maladaptive functioning within the individual. According to Hewitt and Flett's tripartite model, perfectionism can be further broken down into three different domains, including - self-oriented perfectionism (SOP), other-oriented

perfectionism (OOP) and socially prescribed perfectionism (SPP) (Besser et al., 2008; Chang, 2006; Hewitt & Flett, 1991). Hewitt and Flett (1991) note that SOP speaks to one's tendency to both set and seek high standards for oneself, whereas OOP speaks to the tendency to focus on others to be perfect. The third domain, SPP, according to Hewitt and Flett (1991), speaks to one's tendency to believe that those around oneself expect perfection and to feel external pressure to live up to such high standards. Besser et al. (2008) also suggest that perfectionism is a stable personality trait that may impact an individual throughout a variety of different situations.

According to previous literature, individuals who measure higher on perfectionism show an attentional bias towards both negative, as well as perfectionistic content (Besser et al., 2008). Specifically, Besser et al. (2008) contend that individuals who are higher in perfectionism are more likely to pay attention to and remember content that contains a negative, as well as a perfectionistic connotation. Using a word recognition task, these authors discovered that when individuals higher in perfectionism were induced into a negative mood, they had enhanced recognition for both negative as well as perfectionistic words when compared to the presented neutral or positive words.

Besser et al. (2008) argue that the reason for such a result is that individuals who are found to be higher in perfectionism are often cognitively attuned to perfectionistic and negative content such that when presented with similarly emotionally valenced material they will show an attentional bias towards it thereby increasing their ability to recall these words. This is in direct comparison to positive or neutral content in that when individuals higher in perfectionism were presented with positive or neutral words they did not demonstrate enhanced recognition for these subsets of words. It is further proposed that such a bias results from the fact that individuals

higher in perfectionism are constantly striving to achieve a state of perfection and therefore look to external cues that help to validate whether or not they are in fact achieving such a state (Besser, Flett, Hewitt, & Guez, 2008). These authors further propose that if an individual feels as though they are not measuring up to what they perceive to be an ideal state of perfection, this can trigger negative emotions and heighten an individual's overall level of distress serving to inhibit their cognitive resources and subsequently impacting on their ability to perform a cognitive task.

Therefore, when presented with negative or perfectionistic content that is expected to be congruent with their current mood state, Besser et al. (2008) contend that individuals higher in perfectionism incorporate that emotionally valenced content into their self-schema thereby facilitating enhanced recognition. The results of their study would then suggest that the cognitive resources of an individual who is higher in perfectionism are limited to content that is congruent, as opposed to incongruent, with their self-schema. Individuals higher in perfectionism would then find their cognitive resources restricted to perfectionistic or negative content thereby resulting in a decrease in their ability to attend to or remember information that contradicts with their self-schema such as content with positive or neutral connotation (Besser et al., 2008; Wadlinger & Isaacowitz, 2006).

Perfectionistic Cognitions

When looking to understand how it is that mood may impact upon one's cognitive processes, not only is it important to look at perfectionism as a stable individual attribute, as previously discussed, but it is also important to take into consideration how it is that perfectionistic thought patterns more specifically may play a role in the way in which one cognitively processes incoming information. When looking to understand how a personality construct such as perfectionism impacts upon the way in which one is readily able to call upon

and utilize one's cognitive resources, examining the automatic thought processes that accompany this particular construct is key. According to Flett, Hewitt, Blankstein, and Gray (1998), individuals who measure higher in perfectionistic cognitions are often cognitively preoccupied with achieving what they believe to be an ideal state of perfection. These authors further propose that such a preoccupation is associated with frequent automatic and ruminative thoughts with themes involving the discrepancy between what the individual feels is their ideal state and how the individual thinks they are measuring up to such an ideal. If the individual detects a discrepancy between the two, Flett et al. (1998) argue that the level of psychological distress that the individual feels would increase, serving to enhance the preponderance of automatic thoughts. It can then be posited that if an individual has a higher frequency of automatic thoughts with regards to perfectionistic themes, then their ability to cognitively process subsequent information may be impacted due to the fact that their cognitive resources are being utilized elsewhere (Flett et al., 1998).

Threats to Cognitive Performance

When considering the factors that could impact on one's ability to attend to incoming stimuli, it is relevant to consider the impact that threatening situations may have on subsequent performance. According to Hollis-Sawyer and Sawyer (2008), exposure to situations in which an individual repeatedly experiences lower than expected outcomes can result in cognitive deficits that may affect performance. These authors suggest that if an individual is exposed to a situation in which they feel as though success in not a guaranteed outcome, thereby threatening their self-efficacy, their ability to dedicate adequate attentional resources towards the presented task will be inhibited impacting on performance.

Hollis-Sawyer and Sawyer (2008) discovered that when the stereotype threat was present, or when the task was made personally relevant by highlighting ethnic differences, individual cognitive performance was lower compared to when the stereotype threat was absent. This result further indicates that when an individual feels a threat to their personal self-efficacy they become cognitively preoccupied with the emotions the threat has triggered therefore impacting on their ability to perform a cognitive task (Hollis-Sawyer & Sawyer, 2008). These findings are also congruent with research that looks to how, when exposed to a situation that they deem to be personally threatening, individuals higher in perfectionism experience increased levels of psychological distress (Frost & Marten, 1990).

According to Frost and Marten (1990), individuals who measure higher in perfectionism, when presented with an evaluation task, tend to instantaneously appraise the situation as threatening and one in which failure is a possibility and, as a result, cognitively disengage from the presented task. Such a cognitive disengagement results from that the fact that, when presented with a task in which failure is possible, an individual who is higher in perfectionism often feels as though they will not measure up to the expectations of the task therefore failing to achieve their perfect standards (Frost & Marten, 1990). These authors suggest that this results in increased feelings of psychological distress and subsequently negative affect.

Frost and Marten (1990) discovered that when presented with a high threat task, in this instance a task that evaluated writing ability, those individuals who measured higher in perfectionism experienced higher levels of negative affect when compared to individuals lower in perfectionism. In addition, when looking to overall writing ability, those individuals higher in perfectionism had lower writing ability as defined by overall quality of written work when compared to individuals lower in perfectionism. Frost and Marten (1990) suggest that such

results indicate that when presented with a task in which the individual feels their personal self-concept may be threatened, that is that perfection may not be achieved, their level of personal distress increases resulting in their cognitive resources to be depleted impacting on the individual's ability to perform the subsequent task.

Therefore, Frost and Marten (1990) argue that how an individual who measures higher in perfectionism evaluates a situation, whether they deem it to be threatening or nonthreatening, plays a critical role in the way and degree to which they are able to dedicate attentional resources towards the presented task which would impact on task successfulness.

Affect Intensity

In addition to how an individual responds to a threat situation, looking at emotional intensity and how this may impact on one's ability to attend to incoming information is central when considering cognitive ability and particularly attentional processes. Affect intensity refers to the way in which an individual responds to emotions on a day-to-day basis and, as a trait, can range from high to low (Larsen, 2009). More specifically, an individual who measures higher in affect intensity is more likely, on a daily basis, to experience emotions as stronger and more variable, typically reacting with intensity, regardless of whether the emotion is positive or negative. In contrast, someone who measures lower in affect intensity has been found to experience emotions in a milder and less variable manner, reacting in a more moderate way (Larsen, Billings, & Cutler, 1996). These authors further contend that both high and low affect intensity is a stable emotional characteristic amongst individuals and plays a role regardless of the emotion being felt. In addition to the way in which an individual reacts emotionally, affect intensity also plays an important role in how an individual cognitively processes incoming stimuli (Larsen et al., 1996).

Larsen et al. (1996) argue that affect intensity plays a critical part in how an individual allocates their attentional resources and, more specifically, argues that individuals who measure high or low in affect intensity differ in the way in which they respond to incoming stimuli. Such differences could thereby impact on their ability to complete a cognitive task as well as the overall performance outcome in that differing levels of affect intensity would impact on the way and degree to which an individual is able to call upon and utilize their cognitive resources when presented with a performance task (Larsen et al., 1996). For instance, these authors suggest that individuals who measure higher in affect intensity, when presented with emotionally evoking stimuli, pay more attention to and remember this information more so in comparison to individuals who measure lower in affect intensity. Research has suggested that individuals who are higher in affect intensity have been found to react more strongly to emotionally provoking stimuli due to its personal relevance and the fact that it is more congruent to their current emotional state. This would create a cognitive bias such that the individual processes this mood congruent information more deeply when compared to someone who measures lower in affect intensity (Larsen et al., 1996). This would impact on their ability to process subsequent information in that all of their cognitive resources are allocated towards processing the emotions being felt limiting their ability to process any other presented incoming material.

These points further reinforce the mood congruency hypothesis in that individuals who measure higher in affect intensity, relative to those individuals lower in affect intensity, tend to experience emotions more strongly. Thus, the way in which these individuals approach a cognitive task may be influenced by the emotional content it contains and how personally relevant the individual finds it to be (Rusting, 1999). Therefore, understanding where an individual measures in regards to affect intensity is an important addition to experimental

paradigms, especially when looking at how mood impacts on an individual's cognitive processes and, more specifically, how it interacts with their attentional resources.

Present Study

Purpose

The current study seeks to examine how mood interacts with perfectionism to impact on one's attentional and memory processes. Previous research has indicated that mood can influence the types of information to which an individual will attend and the degree to which it will be remembered (Becker & Leinenger, 2011). Furthermore, research has suggested that mood state may play a key role in whether or not an individual will demonstrate an attentional or memory bias towards emotionally valenced content (Wadlinger & Isaacowitz, 2006). More specifically, research has noted that individuals found to measure higher in perfectionism often demonstrate an attentional or memory bias towards perfectionistic as well as negative content and that such a bias can be exacerbated by one's mood state (Besser et al., 2008).

There is however limited research (Besser et al., 2008) in regards to how personality constructs such as perfectionism, can impact on one's cognitive processes. The current study will help to inform the extent to which perfectionism may influence the cognitive processing in individuals. In order to better understand the extent to which perfectionism may impact on an individual's cognitive processing, analyses will explore perfectionism specific findings to verify that these are not simply attributable to a general tendency towards intrusive thoughts. This clarification is important in that by understanding what is occurring cognitively for individuals with differing levels of perfectionism, we may come to better understand how maladaptive thinking patterns may be perpetuated and how these might impact on the functioning of individuals, thereby facilitating possible treatment interventions that target such patterns.

Additionally, the current study sought to understand how it is that threatening situations may impact on one's ability to cognitively process incoming information and whether or not such situations create deficits in overall task performance. Previous research has suggested that when an individual is presented with a situation in which they feel personally threatened, their ability to process incoming information is limited subsequently impacting on their performance (Hollis-Sawyer & Sawyer, 2008). To extend on this literature, the current study sought to examine the potential impact of perfectionism in order to delineate how this particular personality characteristic may interact with threatening situations to affect overall cognitive performance.

Hypotheses

There is an expected 3-way interaction between perfectionism, mood, and threat condition. It is hypothesized that individuals who measure higher in perfectionism, when induced into a negative mood and exposed to the high threat condition will have slower reaction times, recognize less words, and experience deficits in attentional processing speeds relative to the other independent variable combinations.

There is an expected interaction between mood and perfectionism in that those individuals who score higher in perfectionism, when induced into a negative mood, will recognize more, and have slower reaction times for the negative and perfectionistic content but faster reaction times to the neutral and positive words that will be presented within both the recognition and the emotional Stroop task. Additionally, compared to those scoring lower in perfectionism, individuals who score higher in perfectionism who are induced into a negative mood will have slower attentional processing speeds resulting in a lower number of items processed and a higher amount of errors.

There is also an expected interaction between perfectionism and threat condition. Specifically, those individuals measuring higher in perfectionism, when induced into the high threat condition, will have slower reaction times, recognize less, and experience deficits in processing speed when compared to those scoring lower in perfectionism. Should the above-mentioned interactions prove to be not significant, the following main effects are hypothesized.

There is an expected main effect for mood in that when individuals are induced into a mood, whether it is positive, negative or neutral, they will have faster reaction times and recognize more words that are similarly emotionally valenced on the word recognition task and the emotional Stroop task. Additionally, it is hypothesized that those individuals induced into a negative mood, when compared to the positive or neutral mood, will show greater deficits in attentional processing speed as exemplified by lower scores on total number of items processed and overall error rate.

There is a second expected main effect for perfectionism. Specifically, those individuals who score higher on measures of perfectionism will be slower and recognize more perfectionistic words when compared to those who score lower in perfectionism. In addition, it is hypothesized that those individuals who measure higher in perfectionism will demonstrate deficits in attentional processing speed when compared to those scoring lower in perfectionism.

There is a third expected main effect for threat condition in that those individuals who are placed into the high threat condition, compared with those who are placed into the low threat condition, will have slower reaction times, have greater difficulty recognizing words, and will show deficits in processing speed when presented with the three cognitive tasks.

Method

Participants

In total, 121 participants took part in the study. No significant differences were noted across groups on the demographic data collected. Participants ranged between 17 and 46 years of age, with a mean age of 20.97 (*SD* = 4.89). The majority (84.3%) of participants were female. The sample consisted primarily of individuals who were in either their first (92.6%) or second (6.6%) year of post-secondary study. Participants were recruited through an online sign-up system and were offered an incentive, in the form of course credit, to participate in the study.

Self-Report Measures

Perfectionism. Perfectionism was assessed using two measures. The first was the Multidimensional Perfectionism Scale (MPS). The MPS (Hewitt & Flett, 1991) assesses trait perfectionism (see Appendix F). The MPS contains three subscales which assess self-oriented (SOP), other oriented (OOP) and socially prescribed perfectionism (SPP). Only two of the subscales from the MPS, SOP and SPP were included in the final analyses. Due to the fact that the present study sought to uncover the potential impact that perfectionism may have on one's attentional and memory processes only those dimensions (SOP and SPP) that are cognitively related to the individual were included. The MPS was evaluated for reliability and validity using an undergraduate sample of 167 male and female students. Validity was evaluated by assessing the association between the MPS and other social constructs. Validity results indicated significant positive associations between SOP and self-related constructs (e.g., high standards, *r* = .46) and significant positive associations between SPP and socially related constructs (e.g., fear of negative evaluation, *r* = .46; Hewitt & Flett, 1991). The MPS has demonstrated high internal consistency on each of the three subscales with alpha coefficients that range from .82 to .87

(Hewitt & Flett, 1991). The MPS is a 45-item measure in which participants must indicate their level of agreement to statements such as “One of my goals is to be perfect in everything I do” and “I can’t be bothered with people who won’t strive to better themselves”. The MPS uses a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Perfectionism was also assessed using the Perfectionistic Cognitions Inventory (PCI). The PCI (Flett et al., 1998) assesses the frequency of automatic thoughts, which typically focus on achieving a state of perfection (see Appendix G). The PCI was evaluated for validity and reliability on an undergraduate sample of 234 male and female students. It has demonstrated good internal consistency with an alpha coefficient of .96 (Flett et al., 1998). Validity was assessed by examining the association between the PCI and automatic thoughts and results indicated a significant positive association between the two, $r = .66$ (Flett et al., 1998). The PCI is a 25-item measure in which participants must indicate the frequency of statements such as “Why can’t I be perfect” and “ I need to do better”. The PCI uses a 5-point Likert scale ranging from 0 (not at all) to 4 (all of the time).

Affect Intensity. Affect intensity was assessed using the Affect Intensity Measure (AIM). The AIM (Larsen, 1984) assesses the intensity at which individuals feel both positive and negative emotions (see Appendix H). The AIM was evaluated for reliability and validity on an undergraduate sample of 356 male and female students. It has demonstrated good internal consistency with an alpha coefficient of .90 (Larsen, 1984). Validity was also assessed by examining the association between the AIM and other measures of temperament and results indicated significant positive associations (e.g., sociability, $r = .38$, and extraversion, $r = .41$; Larsen, 1984). The AIM is a 40-item measure in which participants must indicate their level of emotional reactions to statements such as “I enjoy being with people very much” and “I feel

pretty bad when I tell a lie". The AIM uses 6-point Likert scale ranging from 1 (never) to 6 (almost always).

Thought Suppression Inventory. Intrusive thoughts were assessed using the Thought Suppression Inventory (TSI), with a focus on the thought intrusion subscale. The TSI (Rassin, 2003) assesses thought intrusion, thought suppression and successful thought suppression (see Appendix I). The TSI was evaluated for reliability and validity on an undergraduate sample of 674 male and female students. It has demonstrated good internal consistency with an alpha coefficient of .88 (Rassin, 2003). Validity was assessed by examining the association between the TSI and psychopathology, with results indicating that the thought intrusion subscale significantly predicted psychopathology symptomology (Rassin, 2003). The TSI is a 15-item measure in which participants must indicate their level of agreement to statements such "I have many unpleasant thoughts" and "I have thoughts which I would rather not have". The TSI uses a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Attentional Tasks

Attention was measured using two tasks. The first task was an emotional Stroop task. Participants were presented with 40 coloured (red, blue, green and yellow) words – 10 positive, 10 negative, 10 neutral, and 10 perfectionism words (see Appendix J). The positive, neutral and negative words for the emotional Stroop were taken from a previously rated list in which a set of independent judges categorized a set of generated words based on their content (Besser et al., 2008). The perfectionism words that were used have been previously validated using an undergraduate sample of 94 students who were asked to rate the words based on their level of perfectionistic content (Besser et al., 2008; Hewitt & Genest, 1990). The participant's task was to

indicate the colour ink of the presented word by selecting the appropriate key, all the while ignoring the content of the presented word (see Appendix K).

The second attentional task that was used is the d2 test of attention (Brickenkamp & Zilmer, 1998). This particular task consists of 14 lines, with each line containing 47 letters (see Appendix L). The lines are composed of the letters "d" and "p" which are presented with one to four dashes, arranged either above or below the letter. The participant's task was to scan each line and cross out all instances of "d's" with two dashes. Participants were timed and asked to work as quickly and accurately as possible. For the current study, total number of items processed and errors of commission were examined as both have been found to be indicators of attentional inhibitory control and accuracy within this particular task (Moore & Malinowski, 2009).

Memory Recognition Task

Memory was measured using a recognition task. The words used in the recognition task were taken from the same generated word lists that were utilized in the emotional Stroop task (see Appendix J). Participants were presented with a total of 40 words - 10 positive, 10 neutral, 10 negative and 10 perfectionism words. Fifty percent of the words presented in the recognition task had been presented previously during the emotional Stroop task and the remaining fifty percent of the words were words taken from the previously generated word lists but were words that the participant had not seen before. Therefore, the participant's task was to recognize whether the presented word was one that matched a word that was presented previously during the emotional Stroop task.

Evaluative Threat

The threat condition that was utilized for the current study involved both a low threat and a high threat condition. In the high threat condition participants were asked to complete a series of 5 math problems which they were told would be indicative of general ability and subsequently were told that they would be graded on performance (see Appendix M). In the low threat condition participants were told that they would be working on a problem-solving task with no indication being given in regards to general ability or evaluation. These instructions have been used in previous research regarding threat manipulation and have been shown to be successful in inducing threat conditions in an academic population (Burns & Friedman, 2011).

Mood Induction

The mood induction for the present study involved three clips: positive, negative and neutral. The positive film clip used to elicit a positive mood was taken from the movie *Happy Feet* whereas the negative film clip used to elicit negative mood was taken from the movie *Sophie's Choice*. The positive and negative film clips were selected based on research previously conducted by Fitzgerald et al. (2011) and Urner et al. (2011), both of whom found significant mood inducing effects using the same aforementioned film clips. The neutral film clip was taken from the movie *Alaska* and featured the landscape of Alaska. Each of the film clips were the same duration of approximately 5 minutes, which is keeping in line with previous research regarding desired film length and mood induction (Gross & Levenson, 1995).

Manipulation Check

In order to ensure that the desired mood was elicited from the aforementioned mood induction procedure, a mood manipulation check was utilized; measures were taken at baseline as well as after participants viewed their respective film clips. The mood manipulation check that

was employed by the current study was taken from the UWIST Mood Adjective Checklist (Matthews et al., 1990). More specifically, the positive (e.g. cheerful, contented, satisfied, happy) and negative (dissatisfied, depressed, sad, sorry) adjectives from the hedonic tone scale from the UWIST Mood Adjective Checklist were utilized (see Appendix N). The UWIST Mood Adjective Checklist was evaluated for reliability on an undergraduate sample of 388 male and female students. The UWIST Mood Adjective Checklist has demonstrated adequate internal consistency with an alpha coefficient of .88 (Matthews et al., 1990). Participants had to indicate their level of current feeling ("Right now I am feeling…") using a 7-point Likert scale ranging from 0 (not at all) to 6 (very much) on each of the eight adjectives. Participants were also asked to rate their current mood state both before and after viewing the film clips using a visual analogue scale (VAS) ranging from -10 to +10 (see Appendix N).

Procedure

The study was presented to participants as a two-part study on personality and mood. The first part of the study was completed online and participants were administered the MPS, the PCI, the TSI and a portion of the demographic questions (see Appendix O). For each of the measures, the questions were visually displayed on their computer screen and the participant's task was to indicate their response by selecting the designated key.

After having completed the first part of the study, participants were then eligible to complete the in lab portion of the study. For the in lab portion, participants were tested in groups of three using computerized data collection software (MediaLab and DirectRT). Participants were randomly assigned to receive one of the three mood induction procedures (positive, negative or neutral) as well as one of the two threat conditions (high or low). Upon arrival to the

laboratory, participants completed the AIM. Following this, all participants were administered the UWIST Mood Adjectives and the VAS. This served as a baseline.

Participants then watched their designated film clip. Following the film clips, participants once again completed the mood manipulation checks including the visual analogue scale as well as the UWIST mood adjectives checklist. After completing these mood measures, participants were asked to complete a series of five math problems with differing instructions based on the threat condition to which they had been randomly assigned. The math problems were presented visually on a computer screen and the participant's task was to indicate the answer to the question provided by selecting the designated key. Each participant was provided with a piece of scrap paper and a calculator to assist in completing the math problems.

After completing the math problems, participants were exposed to a series of cognitive tasks. The tasks that were presented were the emotional Stroop, the d2 test of Attention and the word recognition task. The emotional Stroop and the d2 test of attention were counterbalanced in presentation. For the emotional Stroop task, participants were presented with a series of 40 words (positive, negative, neutral and perfectionism) and were asked to respond to the colour (red, blue, green and yellow) ink of the word by selecting the designated key. Participants were not presented with the next word until the correct response (i.e., the correct colour) was selected. Participants were given 10 practice trials in order to orient themselves to the way in which the stimuli were going to be presented. Participants were instructed to complete the task as quickly and as accurately as possible and performance was measured using reaction time.

For the d2 test of attention, each participant was exposed to 15 lines, including 1 practice line. The participants' task was to scan each line and cross out all instances of "d's" with two dashes while ignoring all other presented characters. Participants were given 20 seconds per line

and were notified orally by the experimenter when to move on to the next line. Participant's performance was measured based on their total number of items processed (TNE) and their overall error rate (accuracy).

In the recognition task, each participant was presented with a series of words and was asked to recognize whether or not the presented word matched one that was previously presented in the emotional Stroop task. Participants had to indicate yes or no by selecting the designated key and were told to do so as quickly and accurately as possible. Participants' performance was measured based on the overall percent of correctly identified words (accuracy). Upon completion of the cognitive tasks, participants answered another set of demographic questions, were thanked for their participation and debriefed.

Results

Data Screening

The data were screened for the presence of univariate outliers. Consistent with previous research, individual scores that fell beyond three standard deviations of the mean were excluded given that they could affect the results and therefore have a confounding effect on the outcome measures presented (Jaeggi, Buschkuehl, Perrig, & Meier, 2010). Only one individual's score from the Multidimensional Perfectionism Scale – socially prescribed perfectionism subscale and two individual scores from the errors of commission outcome variable were eliminated from the final analyses due to the fact that they exceeded three standard deviations beyond the mean.

Sample Characteristics

Pre-test means relative to established norms. Means and standard deviations for each mood condition are presented in Table A1 and are based on the full sample, excluding outliers. The means indicate that relative to existing norms, the participants in this sample as a whole

scored within the normal range. The SOP mean for the whole sample was 71.80 (*SD* = 16.30), the mean SPP score was 53.47 (*SD* = 12.81) and the mean PCI score was 43.05 (*SD* = 16.91). With regards to intrusive thoughts, the mean score on the TSI was 12.16 (*SD* = 4.02) which aligns with previously established norms.

Baseline differences across groups. A univariate ANOVA was used to test whether or not there were differences across groups at baseline on all scales, subscales and mood condition. Baseline measures of perfectionism, intrusive thoughts, affect intensity and subjective ratings of mood did not differ prior to the mood induction procedure (all *Fs* <1).

Outcome Measures

A reliability analysis of all scales and subscales was conducted in order to assess the internal consistency of the items presented (see Table A2). All Cronbach's alpha values exceeded .70 and were therefore deemed acceptable.

Mood Manipulation Check

In order to test the effectiveness of the mood induction procedure, a change score was calculated using the pre mood induction scores and subtracting them from the post mood induction scores. Change scores were calculated using participant ratings on both the visual analogue scale as well as the negative and positive mood adjectives which were presented before and after the mood induction procedure. The manipulation check confirmed that the mood induction procedure was effective (VAS Change Score $F(2, 116) = 26.90$, $p < .0001$, partial $\eta^2 = .32$; Positive Adjectives Change Score $F(2, 116) = 34.71$, $p < .0001$, partial $\eta^2 = 37.$; Negative Adjectives Change Score $F(2, 116) = 38.45$, $p < .0001$, partial $\eta^2 = .40$, see Figures B1-B3). Post hoc analysis revealed that the VAS change scores and the adjective (both positive and negative) change scores in the negative mood condition were significantly lower than that for the positive

and neutral conditions. However, the neutral and positive mood conditions differed significantly only in the positive adjective change scores.

Correlational Analyses

Correlations among all scales and subscales are shown in Table A3. Significant positive associations were found amongst all scales and subscales presented.

Threat Manipulation Check

In order to test the effectiveness of the threat manipulation that was presented, an independent-samples *t*-test comparing accuracy scores, calculated using the number of correct responses, in both the low ($M = 4.26$, $SD = .882$) and high ($M = 2.04$, $SD = 1.143$) threat condition was conducted. This comparison was found to be statistically significant ($t_{(116)} = 11.473$, $p < .001$) and therefore confirmed that the threat condition utilized was effective. Participants had higher accuracy scores in the low threat condition compared to the high threat condition.

Tests of the Effects of Perfectionism, Mood Condition and Threat Condition on Attention

Mood condition and emotional Stroop. Three one-way within subjects ANOVAs were conducted to determine if reaction times differed across the four word types within each of the mood conditions. The observed F value was not statistically significant in the positive ($F(3, 141) = 1.211$, $p = .308$, partial $\eta^2 = .025$), negative ($F(3, 99) = .461$, $p = .710$, partial $\eta^2 = .014$) or neutral conditions ($F(3, 108) = 1.867$, $p = .140$, partial $\eta^2 = .049$).

Perfectionism, mood condition and threat condition on emotional Stroop. A univariate general linear model was used to test for main effects (one continuous: perfectionism, and two categorical: mood condition and threat condition) and relevant interaction effects on reaction time separately for each word type (perfectionism, positive, negative and neutral). For

this model, and all models below, a separate analysis was run for each perfectionism variable (SOP, SPP, PCI). Additionally, for all of the univariate models, if the 3-way interaction was not significant, it was removed and the model was rerun.

Results of the above models for each of the four different word types are displayed in Tables A4-A7. Both SPP ($F(2, 108) = 4.661$, $p = .033$, partial $\eta^2 = .041$) and SOP ($F(2, 109) = 3.437$, $p = .031$, partial $\eta^2 = .062$) had a significant interaction with mood on how fast individuals responded to the neutral words, in that those individuals who scored higher in perfectionism on both the SPP and SOP subscale, when induced into the negative mood, had faster reaction times on the neutral words compared to the positive or neutral mood condition. In the negative mood condition, individuals higher in SOP had faster reaction times when presented with the neutral words compared to those in the positive and neutral mood conditions (see Figure B4). Additionally in the negative mood condition, individuals higher in SPP had faster reaction times when presented with the neutral words compared to those in positive and neutral mood conditions (see Figure B5). Given that a significant interaction was found, main effects were not individually examined for variables in the model that were involved in significant interactions.

A significant main effect of the PCI was found in that those participants who measured higher in perfectionistic cognitions, compared to those who measured lower, were found to have significantly greater reaction times in all four word type conditions: perfectionism ($F(1, 109) = 7.099$, $p = .009$, partial $\eta^2 = .061$), negative ($F(1, 109) = 11.291$, $p = .001$, partial $\eta^2 = .094$), positive ($F(1, 109) = 11.241$, $p = .001$, partial $\eta^2 = .093$), and neutral ($F(1, 109) = 14.983$, $p = .000$, partial $\eta^2 = .121$). These results reinforce the previously stated hypotheses that individuals measuring higher in perfectionism would have slower reaction times for the negative and perfectionistic content but faster reaction times to the neutral content.

Perfectionism, mood condition and threat condition on d2 test of attention. A univariate general linear model was also used to test for main effects (one continuous: perfectionism, and two categorical: mood condition and threat condition) and relevant interaction effects on the total number of items processed (TNE) and errors of commission (E^2). Results of the model are displayed in Tables A8 and A9. Given that none of the interactions were significant, the main effects found to be significant will be discussed. Results indicate a significant main effect of the PCI, in that those participants who were found to measure higher in perfectionistic cognitions had a lower amount of errors of commission as measured by the d2 test of attention ($F(1, 107) = 9.718$, $p = .002$, partial $\eta^2 = .083$). Results failed to support the prediction that those individuals scoring higher in perfectionism would have slower attentional processing speeds resulting in a lower amount of items processed and a higher amount of errors when compared to those lower in perfectionism.

Tests of the Effects of Perfectionism, Mood Condition and Threat Condition on Memory

Mood condition and recognition task. Three one-way within subjects ANOVAs were conducted to determine if accuracy differed across the four word types within each of the mood conditions. The percentage of correct responses was statistically different across word types in the positive ($F(3, 135) = 11.417$, $p = .001$, partial $\eta^2 = .202$), negative ($F(3, 93) = 3.907$, $p = .011$, partial $\eta^2 = .112$), and neutral conditions ($F(3, 108) = 5.184$, $p = .001$, partial $\eta^2 = .126$) when examining the percentage of correct responses.

Bonferroni pairwise comparison tests ($p < .05$) suggested that in the positive mood condition, participants had a significantly higher percent of correct responses with the neutral words ($M = .778$, $SD = .148$), compared to the positive ($M = .680$, $SD = .143$), negative ($M = .691$, $SD = .127$) or the perfectionism words ($M = .629$, $SD = .144$). In the negative mood

condition, Bonferroni pairwise comparison tests ($p < .05$) suggested that participants had a significantly higher percent of correct responses with the neutral words ($M = .746$, $SD = .145$) compared to the positive ($M = .663$, $SD = .127$), negative ($M = .734$, $SD = .119$) or the perfectionism words ($M = .671$, $SD = .150$). Additionally, Bonferroni pairwise comparison tests ($p < .05$) suggested that in the neutral mood condition, participants had a significantly higher percent of correct responses with the neutral words ($M = .745$, $SD = .150$), compared to the positive ($M = .694$, $SD = .130$), negative ($M = .663$, $SD = .169$) or the perfectionism words ($M = .621$, $SD = .162$). Results failed to support the hypothesis that individuals, when induced into a particular mood state, would recognize more words that were similarly emotionally valenced.

Perfectionism, mood condition and threat condition on recognition task. A univariate general linear model was also used to test for main effects (one continuous: perfectionism, and two categorical: mood condition and threat condition) and relevant interaction effects on accuracy (defined as the percentage of correct responses) separately for each word type (perfectionism, positive, negative and neutral). Results of the model are displayed in Tables A10-A13.

For the perfectionism words, there was a significant interaction between SOP and mood ($F(2, 105) = 3.468$, $p = .035$, partial $\eta^2 = .062$) in that those individuals who scored higher on the SOP subscale and were induced in the negative mood had higher accuracy compared to those in the neutral and positive mood conditions when presented with perfectionism words (see Figure B6). There was also a significant interaction between SPP and mood on the number of perfectionism words recognized ($F(2, 104) = 3.364$, $p = .038$, partial $\eta^2 = .061$) in that when individuals higher in this particular facet were presented with this word type and induced into the

negative mood, they had higher accuracy scores compared to those in the positive and neutral mood conditions (see Figure B7).

For the neutral words, there was also a significant interaction between SOP and mood ($F(2, 105) = 3.474$, $p = .035$, partial $\eta^2 = .062$) in that when individuals higher in SOP were induced into a neutral mood and were presented with the neutral words, they had higher accuracy as compared to negative or positive mood conditions (see Figure B8).

For the positive words, there was also a significant interaction between SOP and mood ($F(2, 105) = 3.078$, $p = .050$, partial $\eta^2 = .055$) in that those individuals who scored higher in SOP, when presented with the positive words, had higher accuracy when induced into a neutral mood compared to those in the negative and positive mood induction conditions (see Figure B9). Overall, results reinforce the previously mentioned hypotheses that individuals higher in perfectionism, when induced into a negative mood, would have higher accuracy when presented with the perfectionism words.

With regard to the interaction between perfectionism and threat condition, a significant interaction was noted between SOP and threat condition on the number of neutral words recognized ($F(1, 105) = 8.000$, $p = .006$, partial $\eta^2 = .071$) in that those individuals who scored higher in SOP, when placed into the high threat condition and presented with the neutral words, had lower accuracy scores compared to those who were in the low threat condition (see Figure B10).

For the negative words, a significant interaction was also found between SOP and threat condition ($F(1, 109) = 5.663$, $p = .019$, partial $\eta^2 = .052$) in that when those individuals who were found to measure higher in SOP were placed in the high threat condition, and were presented with the negative words, they had lower accuracy scores compared to those who were placed in

the low threat condition (see Figure B11). Additionally, a significant interaction was found between SPP and threat condition on the number of negative words recognized ($F(1, 105) = 10.116$, $p = .002$, partial $\eta^2 = .089$) in that when individuals scored higher in SPP were placed into the high threat condition and presented with the negative words, they had lower accuracy scores compared to those individuals who were higher in socially-prescribed and placed into the low threat condition (see Figure B12). Results supported the prediction that those individuals measuring higher in perfectionism, when placed into the high threat condition, would have lower accuracy compared to those scoring lower in perfectionism.

Finally, on a separate measure of perfectionism that more specifically addresses perfectionistic cognitions, a significant three-way interaction was found between PCI, mood condition and threat condition when participants were presented with the neutral words ($F(2, 103) = 3.741$, $p = .027$, partial $\eta^2 = .068$). That is, when participants who measured higher on the PCI were placed in the low threat condition and were exposed to the neutral mood condition they had significantly higher accuracy when presented with the neutral words. Whereas those participants who measured lower on the PCI and who were placed in the low difficulty condition had significantly higher accuracy in the positive mood condition, those with higher levels of PCI had greater accuracy in the neutral mood condition (see Figure B13). Those participants, who were found to measure higher on the PCI, when placed in the positive mood condition and exposed to the high threat condition, had significantly higher accuracy when presented with the neutral words. Whereas those participants who were found to measure higher on the PCI and who were placed in the high difficulty condition had significantly lower accuracy in the negative mood condition, those with higher levels of PCI had greater accuracy in the positive mood induction condition (see Figure B13). These results support the prediction that individuals who

measure higher in perfectionism, when induced into the negative mood and exposed to the high threat condition, would have lower accuracy.

Intrusiveness

An exploratory analysis was conducted in order to examine whether or not the previously mentioned findings were related to a tendency towards perfectionistic thoughts or if they were in fact related to a general tendency towards intrusive thoughts. A revised univariate general linear model was used to test for main effects (two continuous: perfectionism and intrusive thoughts, and two categorical: mood condition and threat condition) and relevant interaction effects on the outcome variables. Significant differences that were found between the previous model and the revised model on the emotional Stroop and recognition task outcome variables will be discussed in the following sections. However, no significant differences between the previous model and the revised model were found on the d2 test of attention outcome variables and therefore this will not be discussed.

Perfectionism, intrusive thoughts, mood condition and threat condition on emotional Stroop. When including both perfectionism and intrusive thoughts in the revised univariate general linear model, the main effect found between the PCI and the perfectionism words on the emotional Stroop was no longer found to be significant. However, in the revised univariate general linear model a significant interaction effect was observed, $F(1,106) = 3.381$, $p = .038$, $\eta p^2 = .060$, between perfectionistic cognitions and mood on reaction time to perfectionism words. Specifically, it was found that those participants who measured higher in perfectionistic cognitions and who were exposed to the negative mood condition, had significantly faster reaction times when presented with the perfectionism words compared to those in the positive and neutral mood conditions (see Figure B14).

Perfectionism, intrusive thoughts, mood condition and threat condition on recognition task. When including both perfectionism and intrusive thoughts in the revised univariate general linear model, the interaction effect previously found between self-oriented perfectionism and mood on the number of perfectionism words recognized was no longer significant. In the revised univariate general linear model however, a significant three-way interaction ($F(1, 99) = 3.405$, $p = .037$, $\eta p^2 = .064$) between the Perfectionistic Cognitions Inventory, mood condition and threat condition was found when participants were presented with the negative words. Specifically, those participants who were found to measure higher on the PCI, who were placed in the low threat condition and were exposed to the neutral mood condition they had significantly higher accuracy when presented with the negative words. Whereas those participants who measured lower on the PCI and who were placed in the low difficulty condition had significantly higher accuracy in the positive mood condition, those with higher levels of PCI had greater accuracy in the neutral mood condition (see Figure B15). Those participants, who were found to measure higher on the PCI, when placed in the neutral mood condition and exposed to the high threat condition, had significantly higher accuracy when presented with the negative words. Whereas those participants who were found to measure higher on the PCI and who were placed in the high difficulty condition had significantly lower accuracy in the positive mood condition, those with higher levels of PCI had greater accuracy in the neutral mood induction condition (see Figure B15).

Discussion

The main purpose behind the present study involved examining how mood interacts with perfectionism, in response to various degrees of threat, to impact on one's attentional and memory processes. Recent research has indicated that mood can influence the types of

information to which an individual will attend and the degree to which it will be remembered (Becker & Leinenger, 2011). Additionally, research has noted that individuals higher in perfectionism often demonstrate an attentional or memory bias towards perfectionistic and negative content, and that such a bias may be impacted by one's mood state (Besser et al., 2008).

The present study also sought to understand how it is that threatening situations may impact on one's ability to cognitively process incoming information and whether or not such situations can create deficits in overall task performance. Previous research has suggested that when an individual is presented with a situation in which they feel personally threatened, their ability to process incoming information is limited, thus subsequently impacting on their task performance (Hollis-Sawyer & Sawyer, 2008). To extend upon this literature, the current study examined how perfectionism might interact with perceived threat to impact cognitive performance.

Whereas a significant interaction between perfectionism, mood condition and threat condition was hypothesized on each of the study's main outcome variables (reaction time, attentional processing and task accuracy), this interaction was only found to be significant on accuracy for neutral words in the word recognition task. This interaction will be discussed in the task accuracy section below. In those instances where the higher order interaction between perfectionism, mood and threat condition was not found to be significant, a number of interaction and relevant main effects were observed. In the sections below, a discussion of these, as related to the study hypotheses, will be presented based on the main study outcomes – reaction time, attentional processing and task accuracy.

Reaction Time

Results of the present study found that perfectionism significantly interacted with mood such that those individuals who scored higher in SOP or in SPP, when exposed to the negative mood condition, had faster reaction times when presented with the neutral words compared to those individuals lower in perfectionism.

As mentioned previously, research has demonstrated that when individuals higher in depressive symptomology were presented with the emotional Stroop task, they were found to have slower reaction times when they were presented with negative as opposed to positive or neutral content (Dai & Feng, 2011). More specifically, these authors suggest that such a result is due to the fact that these individuals are unable to keep the meaning of the negative words out of their cognitive awareness. This would thus limit the individual's ability to cognitively disengage their attentional resources from the content of the word, serving to increase the time it takes them to respond to the colour ink of the word (Dai & Feng, 2011; Sharma et al., 2011). With regards to the present study, this would suggest that when presented with the neutral words, because they lacked emotional valence and were emotionally incongruent with their induced negative mood state, individuals higher in SOP or SPP were better able to successfully cognitively disengage their attentional resources from the neutral content of the word, and focus on the colour ink of the word, subsequently decreasing their reaction times.

In addition, it was noted that compared to those lower in perfectionism, individuals higher in perfectionism, when induced into the positive mood, had slower reaction times when exposed to the neutral words. This finding can be understood in light of research that has suggested that when individuals are induced into a positive mood, they will work hard to maintain this positive state and as such, in an effort to be successful at preserving these positive

emotions, will dedicate more attentional resources towards the task at hand (Silvestrini & Gendolla, 2007). Additionally, when examining perfectionism, there is some debate as to the extent to which these individuals experience positive moods on a daily basis, with some researchers suggesting that an individual's constant desire to be perfect results in lower positive affect and therefore a lower prevalence of positive emotions (Besser et al., 2008). In relation to the current study, it is possible that when individuals higher in SOP and SPP were induced into a positive mood, their desire to preserve this positive emotional state was elevated. Therefore, as the literature would suggest, when they were presented with the neutral words these individuals may have dedicated more attentional resources towards the task in an effort to be successful and maintain their overall positive emotional state. As such, they may have had more difficulty disengaging their attentional resources, consequently resulting in increased reaction times as compared to those individuals in the negative mood condition who had faster reaction times when presented with the neutral words.

With regards to perfectionistic cognitions, an interesting effect was noted with regards to reaction time. Results support the hypothesis that those individuals who scored higher on the PCI, when presented with all four words types (positive, negative, neutral and perfectionism) would have slower reaction times when compared to individuals lower in these. The results support previous literature that has suggested that individuals higher in perfectionistic cognitions are often preoccupied with trying to achieve what they perceive to be an ideal state and, when seemingly not able to meet such high standards, they often experience psychological distress that can limit their ability to dedicate cognitive resources towards a performance task (Flett et al., 1998). In relation to the present study, when individuals measuring higher in perfectionistic cognitions were presented with the emotional Stroop task, their ability to successfully dedicate

cognitive resources to the task at hand was limited as they were instead focused on trying to achieve a state of perfection resulting in slower reaction times as compared to individuals lower in perfectionistic cognitions. In addition to looking at reaction time as a measure of attentional processes, it is also important to examine attentional processing and how factors such as perfectionism, mood and threat condition may impact upon task performance.

Attentional Processing

While it was hypothesized that perfectionism and mood would interact to result in slower attentional processing speeds resulting in a lower amount of items processed and a higher number of errors, only a significant effect of the PCI on the number of errors was noted. Results indicated that perfectionistic cognitions significantly impacted errors of commission, but not the total number of items processed. More specifically, results suggest that individuals higher in perfectionistic cognitions had an overall lower number of errors of commission when compared to individuals lower in perfectionistic cognitions, which is against what was predicted.

One possibility that could account for these discrepant findings is that research has proposed that when confronted with a cognitive performance task, the need of those higher in perfectionism to strive towards being perfect, may not affect their overall accuracy but may negatively impact on other indicators such as overall task efficiency. Errors of commission, which has been noted to be a less common type of error, are typically associated with an individual's ability to accurately distinguish between target and non-target letters (Brickenkamp & Zillmer, 1998; Moore & Malinwoski, 2009). Thus, in relation to the present study findings, if participants higher in perfectionistic cognitions had an overarching desire to be perfect, their ability to quickly work through a task may be negatively impacted while their overall ability to distinguish between the target and non-target letters is not necessarily affected.

Although a significant effect of perfectionism on total number of items processed had been predicted, the lack of such a finding in this study may be understood by more closely examining how the outcome variable of interest was measured. That is, while the number of items processed was intended to be a measure of an individual's ability to be both accurate and fast, when individuals higher in perfectionism were presented with this particular task their ability to remain accurate was not necessarily impaired even if their overall efficiency was. These results would then suggest that in the end the higher accuracy and lower efficiency combined into results that compare to what has been reported in the literature to be average (Brickenkamp & Zillmer, 1998). A measure that separates accuracy from efficiency might have allowed us to better understand how it is that perfectionism specifically impacts on each of these cognitive components separately and whether deficits in performance would be evident as originally predicted. In addition to looking at how it is that perfectionism, mood and threat condition may impact on one's attentional processes, it is also important to examine how one's memory processes and more specifically how task accuracy may be impacted upon these particular constructs.

Task Accuracy

As mentioned previously, results suggest that mood condition, threat condition and the PCI significantly interacted on the number of neutral words recognized. Specifically, results support the prediction that individuals measuring higher in perfectionism when induced into a negative mood and exposed to the high threat condition would recognize fewer words overall when compared to the positive mood condition. This reinforces previous research that has suggested that when an individual higher in perfectionistic cognitions experiences a negative mood it is perceived as an indication that there is a discrepancy between their current state and

their ideal state and, moreover, if that individual feels that their self-concept is being threatened, it can trigger feelings of psychological distress and negative affect (Besser et al., 2008; Besser et al., 2008). For the current study, this would suggest that such feelings, when triggered by both the negative mood condition and the high threat condition, served to limit the individual's cognitive capabilities thus resulting in a decreased accuracy rate as compared to those individuals higher in perfectionistic cognitions who were induced into a positive or neutral mood.

With regards to SOP and SPP, results supported the prediction that the interaction between mood and perfectionism would result in higher accuracy rates on the recognition task and specifically results suggest that those individuals who were found to score higher in SOP and SPP, when induced into a negative mood, demonstrated higher overall accuracy rates when presented with the perfectionism words. These findings are consistent with the literature suggesting that when an individual is higher in perfectionism, they are often cognitively attuned to content that is personally relevant and as such are better able to recall words that are similarly valenced, thereby demonstrating a memory bias (Besser et al., 2008).

In addition, research has suggested that when an individual who measures higher in perfectionism is induced into a negative mood, their ability to recall perfectionistic content is increased as these individuals pay more attention to self-relevant information (Besser et al., 2008). Consequently, when a participant measuring higher in SOP and SPP was placed into a negative mood and was presented with perfectionistic themed words, the increased personal relevance and degree of emotional congruence activated a memory bias for same. Such a memory bias may have then increased their ability to accurately recognize perfectionistic content resulting in significantly higher overall accuracy for this particular word type. This is in direct

comparison to those individuals higher in these perfectionism facets who were placed into the positive or neutral mood conditions whose ability to accurately recall the perfectionism words was relatively lower given that, although personally relevant, they were not necessarily congruent with their current emotional state.

Beyond having explored how perfectionism and mood condition interact to affect task accuracy, the current study was also interested in examining the way in which perfectionism and threat condition might interact to affect accuracy. To this end, it was hypothesized that the interaction of perfectionism and threat condition would result in lower degree of task accuracy. Results supported this prediction and suggested that individuals who scored higher in SPP and SOP, and who were placed in the high threat condition, were significantly less accurate in recognizing negative words when compared to those individuals who were placed into the low threat condition. When looking to understand how it is that threat condition and perfectionism may have impacted on accuracy, it is important to understand how it is that perceived threat situations can impact an individual higher in perfectionism.

Research has suggested that when an individual who measures higher in perfectionism is presented with a task on which they will be evaluated, cognitive disengagement can occur (Frost & Marten, 1990). More specifically, if the individual appraises the presented task as one in which failure is a possibility, and as having the potential to compromise the individual's perfectionistic ideals, they are more likely to disengage from the task thus allowing the individual to avoid the situation. However, such disengagement can result in increased feelings of psychological distress and negative affect (Frost & Marten, 1990).

This research is relevant to the present study in that if individuals higher in both SPP and SOP, when placed into the high threat condition, appraised the situation as one in which failure

was a possibility, their likelihood to cognitively disengage from it would have increased resulting in increased negative affect. Additionally, the high threat condition may have highlighted the evaluative nature of the task thereby increasing feelings of negative affect amongst individuals higher in SOP and SPP. This may have then impacted on their ability to dedicate sufficient cognitive resources towards the task. Furthermore, when these individuals were presented with words that may have been deemed personally relevant, their ability to accurately recall those words was lower as they were instead focused on trying to maintain their perfectionistic ideals. This was also the case when individuals higher in SOP were presented with the neutral words emphasizing the fact that even when presented with words that are not personally relevant the individual's ability to accurately identify them was still inhibited resulting in lower accuracy.

General Conclusions

The results of the current study help to inform research that specifically looks at how it is that perfectionism may impact on one's cognitive processes. When examining the results of the current study it is important to consider whether or not the study's findings are attributable to perfectionistic related cognitions or if they might be related to a more general tendency towards intrusive thoughts. While intrusive thoughts more generally may influence attentional and memory processes in individuals (Brewin & Smart, 2005; Hayes, Hirsch, & Matthews, 2010), the present study suggests that perfectionism specific cognitions help to explain unique variability beyond the more general intrusiveness of thoughts, as evidenced by the fact that when intrusive thoughts was included in the revised model, only minimal differences were noted.

Although the results of the study may suggest some inconsistency at times with regard to the effect of perfectionism on study outcomes, in more closely attending to the nuances across perfectionism indicators, it becomes clearer how certain facets might be more influential under

particular circumstances (e.g. SPP in a certain mood conditions resulted in greater accuracy when presented with the perfectionism words while the PCI did not). These results make sense given the fact that although the various perfectionism indicators utilized within the current study may represent the same overarching construct, each represents a unique characteristic that can be observed to varying degrees in an individual. For instance, SPP speaks to the tendency to believe that those around oneself expect perfection and has been consistently linked with indices of maladjustment (Hewitt & Flett, 1991). Furthermore, it has been suggested that SPP is more associated with feelings of negative affect and as such individuals higher in the particular facet of perfectionism may demonstrate a cognitive bias towards perfectionistic content thus reinforcing the findings from the current study.

Moreover, it is also interesting to note that the PCI, which is a more cognitively focused perfectionism indicator, was consistently found to be predictive of attentional and memory outcomes which given the cognitively focused nature of the tasks aligns with what was found. Flett et al. (1998) argue that individuals higher in perfectionistic cognitions often find themselves cognitively preoccupied with achieving what they believe is an ideal state of perfection. Additionally, those evidencing a stronger tendency toward perfectionistic cognitions are often preoccupied with frequent automatic and ruminative thoughts surrounding the need to be perfect. This preoccupation could then impact on their attentional and memory processes and in doing so impact on how they perform a cognitive task such as those presented within the current study.

Limitations and Future Directions

While the current study allowed us to better understand the underlying cognitive processes of individuals higher in perfectionism and how such processes are impacted upon by mood and threat situations, they were however some limitations to the study that might impact

on the interpretation of the results. For example, the present study was administered as a two-part study, with the time in between when participants completed the self-report measures and when they completed the in lab portion was on average 14.93 days (*SD* = 23.59). This variability may have negatively impacted the study in that the time in between part one and part two may have influenced the way in which participants originally responded to measures such as the PCI. However, while the items on the PCI deal with situations that may be influenced by an individual's current state and therefore may be malleable to change, research does suggest that it still tends to be fairly consistent with a test-retest reliability of .67 (Flett et al., 1998). Therefore, it is possible that although the PCI is a state-like measure, and the fact that there was some variability between part one and part two administrations, it still represents a valid and stable perfectionism measure.

Another limitation noted within the study was the fact that the neutral mood condition did not differ significantly from the positive mood condition and therefore represents a limitation with regards to the mood induction procedure used for the current study. It is possible that the film clip chosen for the neutral condition, although it has been previously used and was effective at creating differences between positive and neutral, when administered in the current study it may have contributed to more of a relaxed or peaceful mood state as opposed to a neutral mood state. It is also possible that perhaps the words that were chosen to assess the effectiveness of the mood induction technique did not allow us to adequately differentiate between the positive and neutral mood states and instead could be applied to both mood conditions. Future research should look to other neutral mood induction techniques as well as other mood manipulation checks in order to ensure that participant moods are neither positive nor negative when in this particular condition.

A final area for future research that was not addressed within the context of the current study but would be interesting to examine would be whether or not the current findings would hold true across not only maladaptive indicators of perfectionism such as the PCI and the SPP but across adaptive perfectionism indicators as well. Currently, there is some debate in the literature that perfectionism contains not only a maladaptive component as previously discussed but that it contains an adaptive component as well (Chang, 2006). Very few studies to date have examined how it is that adaptive perfectionism indicators may impact on how an individual approaches a cognitive task such as those utilized within the current study (Eum & Rice, 2011; Rice, Ashby, & Gilman, 2011). Therefore, if such an adaptive component exists, it is worth examining whether or not individuals higher in adaptive perfectionism show the same deficits as those that were evidenced within the current study, which looked solely at the maladaptive aspects of perfectionism. Doing so, will help to facilitate the ongoing discussion with regards to whether or not perfectionism might consist of both a maladaptive and an adaptive component, with the underlying idea being that if in fact differences did exist, these should be observable on actual outcomes such as the attentional and memory related processes of interest in the present study.

Implications

In conclusion, very few studies have been conducted looking at how perfectionism and mood interact to impact on one's attentional and memory processes. Additionally, the current study helped to highlight how it is that threatening situations interact with mood and perfectionism and how such combination can impact upon an individual's cognitive performance. Given the fact that there is a lack of experimental research in this particular area and that impairments in cognitive abilities were evidenced amongst some of the perfectionism

indicators, with an attentional or memory bias being noted in some cases, it is important that future research extend upon this idea by examining these deficits in a sample solely made up of students found to measure higher on the extremes of these perfectionism variables. This would then allow researchers to better understand the underlying cognitive and motivational processes that may be influencing these individuals and how such processes may impact upon their cognitive performance. On a daily basis students are faced with situations that may call into questions their perfectionistic ideals, which could then impact on their ability to cognitively process incoming information. Therefore, by understanding how it is that this thinking pattern may be perpetuated, for instance through the continuation of attentional or memory biases, it can help to facilitate successful interventions targeted at decreasing these automatic perfectionistic thoughts thereby allowing these individuals to be successful within the academic domain.

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Appendices

Appendix A

Table A1

Comparison of means (standard deviations) on each of the scales, subscales and outcome variables

	Mood Condition		
	Positive (N = 48)	Negative (N = 34)	Neutral (N = 37)
Scales and Subscales			
SOP	70.81 (16.21)	70.71 (16.50)	74.46 (16.72)
SPP	52.46 (11.44)	53.76 (13.17)	54.70 (14.45)
PCI	45.81 (16.26)	41.24 (16.28)	42.16 (18.11)
TSI	12.25 (3.94)	12.62 (4.60)	11.62 (3.61)
Outcome Variables			
RT			
PerfRT	788.46 (143.89)	797.96 (140.30)	792.61 (193.34)
NegRT	804.78 (157.87)	815.23 (158.23)	811.55 (178.97)
PosRT	773.19 (134.58)	797.81 (133.95)	834.77 (190.47)
NeuRT	792.47 (167.87)	820.54 (186.03)	798.78 (174.88)
Accuracy			
PctCorrectPerf	.629 (.144)	.671 (.150)	.621 (.162)
PctCorrectNeg	.690 (.126)	.734 (.119)	.681 (.129)
PctCorrectPos	.680 (.143)	.663 (.127)	.694 (.130)
PctCorrectNeu	.777 (.148)	.746 (.146)	.746 (.150)
E^2	2.31(2.37)	3.39 (3.32)	2.42 (2.47)
TNE	468.31(62.27)	453.09 (69.32)	455.22 (71.14)

Note. RT = Reaction Time (in milliseconds on the emotional Stroop); Accuracy (percent of correct responses on the recognition task); E^2 = Errors of Commission (on the d2 Test of Attention); TNE = Total Number of Items Processed minus Errors (on the d2 Test of Attention); SOP = Self-Oriented Perfectionism; SPP = Socially-Prescribed Perfectionism; PCI = Perfectionistic Cognitions Inventory; TSI = Thought Suppression Inventory.

Table A2

Reliability analysis of all scales and subscales for current sample

Scale or Subscale	Cronbach's Alpha	Number of Items
MPS– Self-Oriented Perfectionism	.91	15
MPS – Socially-Prescribed Perfectionism	.83	15
PCI	.92	25
AIM	.88	40
TSI	.73	5

Note. MPS = Multidimensional Perfectionism Scale; PCI = Perfectionistic Cognitions Inventory; AIM = Affect Intensity Measure; TSI = Thought Suppression Inventory.

Table A3

Correlations among perfectionism, affect intensity and intrusive thoughts for the total sample

Variables	1	2	3	4	5
1. SOP	-				
2. SPP	.58**	-			
3. PCI	.53**	.34**	-		
4. AIM	.41**	.37**	.32**	-	
5. TSI	.23*	.33**	.27**	.20*	-

Note. n = 121. SOP = Self-Oriented Perfectionism; SPP = Socially-Prescribed Perfectionism; PCI = Perfectionistic Cognitions Inventory; AIM = Affect Intensity Measure; TSI = Thought Suppression Inventory. ** = $p < .001$, * = $p < .05$

Table A4

Summary of general linear model results for emotional Stroop outcome variable reaction time on perfectionism words

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(9,109) = 2.128$, $p = .033$*, $\eta p^2 = .149$					
PCI	1	109	7.099	.009*	.061
MoodCond	2	109	2.663	.074	.047
ThreatCond	1	109	.383	.537	.003
PCI*MC	2	109	2.615	.078	.046
PCI*TC	1	109	.523	.471	.005
TC*MC	2	109	1.295	.278	.023
Model 2: $F(9,109) = 1.068$, $p = .392$, $\eta p^2 = .081$					
SOP	1	109	1.824	.180	.016
MoodCond	2	109	2.158	.120	.038
ThreatCond	1	109	.270	.604	.002
SOP*MC	2	109	2.171	.119	.038
SOP*TC	1	109	.376	.541	.003
TC*MC	2	109	1.612	.204	.029
Model 3: $F(9,108) = 1.360$, $p = .216$, $\eta p^2 = .102$					
SPP	1	108	3.373	.069	.030
MoodCond	2	108	2.752	.068	.048
ThreatCond	1	108	.264	.608	.002
SPP*MC	2	108	2.879	.061	.051
SPP*TC	1	108	.174	.678	.002
TC*MC	2	108	1.609	.205	.029

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition; * = $p < .05$.

Table A5

Summary of general linear model results for emotional Stroop outcome variable reaction time on negative words

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(9,109) = 2.708$, $p = .007$*, $\eta p^2 = .183$					
PCI	1	109	11.291	.001*	.094
MoodCond	2	109	2.433	.093	.043
ThreatCond	1	109	.359	.550	.003
PCI*MC	2	109	2.460	.090	.043
PCI*TC	1	109	.141	.708	.001
TC*MC	2	109	1.752	.178	.031
Model 2: $F(9,109) = 1.376$, $p = .208$, $\eta p^2 = .102$					
SOP	1	109	2.461	.120	.022
MoodCond	2	109	2.282	.107	.040
ThreatCond	1	109	1.612	.207	.015
SOP*MC	2	109	2.243	.111	.040
SOP*TC	1	109	1.460	.229	.013
TC*MC	2	109	2.028	.137	.036
Model 3: $F(9,108) = 1.261$, $p = .267$, $\eta p^2 = .095$					
SPP	1	108	3.041	.084	.027
MoodCond	2	108	1.176	.312	.021
ThreatCond	1	108	.792	.375	.007
SPP*MC	2	108	1.217	.300	.022
SPP*TC	1	108	.639	.426	.006
TC*MC	2	108	2.207	.115	.039

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition * = $p < .05$

Table A6

Summary of general linear model results for emotional Stroop outcome variable reaction time on positive words

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(9,109) = 3.347$, $p = .001$*, $\eta p^2 = .217$					
PCI	1	109	11.241	.001*	.093
MoodCond	2	109	1.707	.186	.030
ThreatCond	1	109	.370	.544	.003
PCI*MC	2	109	2.075	.130	.037
PCI*TC	1	109	.561	.455	.005
TC*MC	2	109	3.175	.046*	.055
Model 2: $F(9,109) = 2.223$, $p = .026$*, $\eta p^2 = .155$					
SOP	1	109	2.533	.114	.023
MoodCond	2	109	2.437	.092	.043
ThreatCond	1	109	.801	.373	.007
SOP*MC	2	109	2.530	.084	.044
SOP*TC	1	109	.819	.368	.007
TC*MC	2	109	3.552	.032	.061
Model 3: $F(9,108) = 2.233$, $p = .025$*, $\eta p^2 = .157$					
SPP	1	108	6.586	.012*	.057
MoodCond	2	108	1.016	.365	.018
ThreatCond	1	108	.010	.919	.000
SPP*MC	2	108	.843	.433	.015
SPP*TC	1	108	.017	.897	.000
TC*MC	2	108	3.064	.051	.054

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition * = $p < .05$

Table A7

Summary of general linear model results for emotional Stroop outcome variable reaction time on neutral words

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(9,109) = 3.078$, $p = .003$*, $\eta p^2 = .203$					
PCI	1	109	14.983	.000*	.121
MoodCond	2	109	2.034	.136	.036
ThreatCond	1	109	.337	.563	.003
PCI*MC	2	109	1.508	.226	.027
PCI*TC	1	109	.036	.849	.000
TC*MC	2	109	2.312	.104	.041
Model 2: $F(9,109) = 1.908$, $p = .058$, $\eta p^2 = .136$					
SOP	1	109	3.059	.083	.027
MoodCond	2	109	3.604	.031*	.062
ThreatCond	1	109	1.748	.189	.016
SOP*MC	2	109	3.437	.036*	.059
SOP*TC	1	109	1.347	.248	.012
TC*MC	2	109	2.925	.058	.051
Model 3: $F(9,108) = 2.501$, $p = .012$*, $\eta p^2 = .172$					
SPP	1	108	4.661	.033*	.041
MoodCond	2	108	5.057	.008*	.086
ThreatCond	1	108	.970	.327	.009
SPP*MC	2	108	5.107	.008*	.086
SPP*TC	1	108	.679	.412	.006
TC*MC	2	108	3.342	.039*	.058

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition * = $p < .05$

Table A8

Summary of general linear model results for the d2 test of attention outcome variable TNE

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(9,109) = .530$, $p = .850$, $\eta p^2 = .042$					
PCI	1	109	.000	.998	.000
MoodCond	2	109	1.659	.195	.030
ThreatCond	1	109	.330	.567	.003
PCI*MC	2	109	1.246	.292	.022
PCI*TC	1	109	.414	.521	.004
TC*MC	2	109	.414	.662	.008
Model 2: $F(9,109) = .465$, $p = .895$, $\eta p^2 = .037$					
SOP	1	109	.822	.367	.007
MoodCond	2	109	.993	.374	.018
ThreatCond	1	109	.160	.690	.001
SOP*MC	2	109	.743	.478	.013
SOP*TC	1	109	.208	.649	.002
TC*MC	2	109	.400	.671	.007
Model 3: $F(9,108) = .607$, $p = .789$, $\eta p^2 = .048$					
SPP	1	108	2.283	.134	.021
MoodCond	2	108	.417	.660	.008
ThreatCond	1	108	.221	.639	.002
SPP*MC	2	108	.373	.689	.007
SPP*TC	1	108	.271	.604	.003
TC*MC	2	108	.506	.604	.009

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition * = $p < .05$

Table A9

Summary of general linear model results for the d2 test of attention outcome variable errors of commission

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(9,107) = 2.007$, $p = .045$*, $\eta p^2 = .144$					
PCI	1	107	9.718	.002*	.083
MoodCond	2	107	.996	.373	.018
ThreatCond	1	107	1.811	.181	.017
PCI*MC	2	107	.464	.630	.009
PCI*TC	1	107	2.299	.132	.021
TC*MC	2	107	1.285	.281	.023
Model 2: $F(9,107) = 1.037$, $p = .416$, $\eta p^2 = .080$					
SOP	1	107	2.218	.139	.020
MoodCond	2	107	.038	.963	.001
ThreatCond	1	107	1.843	.177	.017
SOP*MC	2	107	.019	.981	.000
SOP*TC	1	107	2.016	.159	.018
TC*MC	2	107	.782	.460	.014
Model 3: $F(9,106) = 1.049$, $p = .407$, $\eta p^2 = .082$					
SPP	1	106	.201	.655	.002
MoodCond	2	106	.693	.502	.013
ThreatCond	1	106	.066	.797	.001
SPP*MC	2	106	1.313	.273	.024
SPP*TC	1	106	.058	.810	.001
TC*MC	2	106	.790	.457	.015

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition * = $p < .05$

Table A10

Summary of general linear model results for recognition task outcome variable accuracy on perfectionism words

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(9,105) = 1.229$, $p = .285$, $\eta p^2 = .095$					
PCI	1	105	.005	.941	.000
MoodCond	2	105	.552	.577	.010
ThreatCond	1	105	.269	.605	.003
PCI*MC	2	105	1.447	.240	.027
PCI*TC	1	105	.001	.973	.000
TC*MC	2	105	1.922	.151	.035
Model 2: $F(9,105) = 1.740$, $p = .089$, $\eta p^2 = .130$					
SOP	1	105	.681	.411	.006
MoodCond	2	105	2.609	.078	.047
ThreatCond	1	105	.027	.870	.000
SOP*MC	2	105	3.468	.035*	.062
SOP*TC	1	105	.204	.652	.002
TC*MC	2	105	1.906	.154	.035
Model 3: $F(9,104) = 2.078$, $p = .038$*, $\eta p^2 = .152$					
SPP	1	104	3.517	.064	.033
MoodCond	2	104	2.495	.087	.046
ThreatCond	1	104	.121	.729	.001
SPP*MC	2	104	3.364	.038*	.061
SPP*TC	1	104	.000	.987	.000
TC*MC	2	104	1.816	.168	.034

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition * = $p < .05$

Table A11

Summary of general linear model results for recognition task outcome variable accuracy on negative words

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(9,104) = 1.065$, $p = .395$, $\eta p^2 = .084$					
PCI	1	104	.400	.529	.004
MoodCond	2	104	.523	.594	.010
ThreatCond	1	104	1.788	.184	.017
PCI*MC	2	104	.078	.925	.002
PCI*TC	1	104	1.707	.194	.016
TC*MC	2	104	1.516	.224	.028
Model 2: $F(9,109) = 1.501$, $p = .157$, $\eta p^2 = .115$					
SOP	1	109	.642	.425	.006
MoodCond	2	109	.165	.848	.003
ThreatCond	1	109	5.730	.018*	.052
SOP*MC	2	109	.200	.819	.004
SOP*TC	1	109	5.663	.019*	.052
TC*MC	2	109	1.914	.153	.035
Model 3: $F(9,103) = 2.240$, $p = .025$*, $\eta p^2 = .164$					
SPP	1	103	.557	.457	.005
MoodCond	2	103	.262	.770	.005
ThreatCond	1	103	10.116	.002*	.089
SPP*MC	2	103	.058	.943	.001
SPP*TC	1	103	9.963	.002*	.088
TC*MC	2	103	2.709	.071	.050

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition * = $p < .05$

Table A12

Summary of general linear model results for recognition task outcome variable accuracy on positive words

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(9,105) = .410$, $p = .927$, $\eta p^2 = .034$					
PCI	1	105	.912	.342	.009
MoodCond	2	105	.192	.826	.004
ThreatCond	1	105	.010	.922	.000
PCI*MC	2	105	.046	.955	.001
PCI*TC	1	105	.039	.845	.000
TC*MC	2	105	.720	.489	.014
Model 2: $F(9,105) = .982$, $p = .459$, $\eta p^2 = .078$					
SOP	1	105	.097	.756	.001
MoodCond	2	105	2.758	.068	.050
ThreatCond	1	105	.262	.610	.002
SOP*MC	2	105	3.078	.050*	.055
SOP*TC	1	105	.347	.557	.003
TC*MC	2	105	.460	.633	.009
Model 3: $F(9,104) = .746$, $p = .666$, $\eta p^2 = .061$					
SPP	1	104	2.411	.124	.023
MoodCond	2	104	.302	.740	.006
ThreatCond	1	104	.557	.457	.005
SPP*MC	2	104	.442	.644	.008
SPP*TC	1	104	.602	.440	.006
TC*MC	2	104	.831	.439	.016

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition * = $p < .05$

Table A13

Summary of general linear model results for recognition task outcome variable accuracy on neutral words

	df (effect)	df (error)	F	p	ηp^2
Model 1: $F(11,103) = 2.019$, $p = .034$*, $\eta p^2 = .177$					
PCI	1	103	.095	.758	.001
MoodCond	2	103	1.190	.308	.023
ThreatCond	1	103	2.287	.134	.022
PCI*MC	2	103	1.261	.288	.024
PCI*TC	1	103	3.823	.053	.036
TC*MC	2	103	4.566	.013*	.081
PCI*TC*MC	2	103	3.741	.027*	.068
Model 2: $F(9,105) = 2.574$, $p = .010$*, $\eta p^2 = .181$					
SOP	1	105	1.263	.264	.012
MoodCond	2	105	3.597	.031*	.064
ThreatCond	1	105	6.851	.010*	.061
SOP*MC	2	105	3.474	.035*	.062
SOP*TC	1	105	8.000	.006*	.071
TC*MC	2	105	4.410	.014*	.077
Model 3: $F(9,104) = 1.381$, $p = .206$, $\eta p^2 = .107$					
SPP	1	104	.413	.522	.004
MoodCond	2	104	.077	.926	.001
ThreatCond	1	104	.728	.396	.007
SPP*MC	2	104	.062	.940	.001
SPP*TC	1	104	.934	.336	.009
TC*MC	2	104	4.791	.010	.084

Note. PCI: Perfectionistic Cognitions Inventory; SOP: Self-Oriented Perfectionism; SPP: Socially-Prescribed Perfectionism; MC: Mood Condition; TC: Threat Condition * = $p < .05$

Appendix B

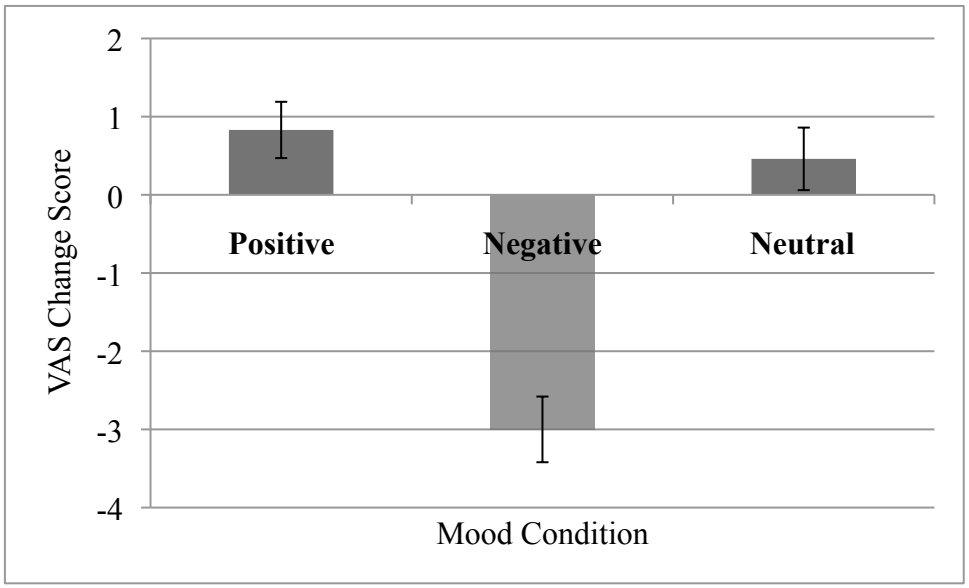


Figure B1. Visual analogue change score (post minus pre)

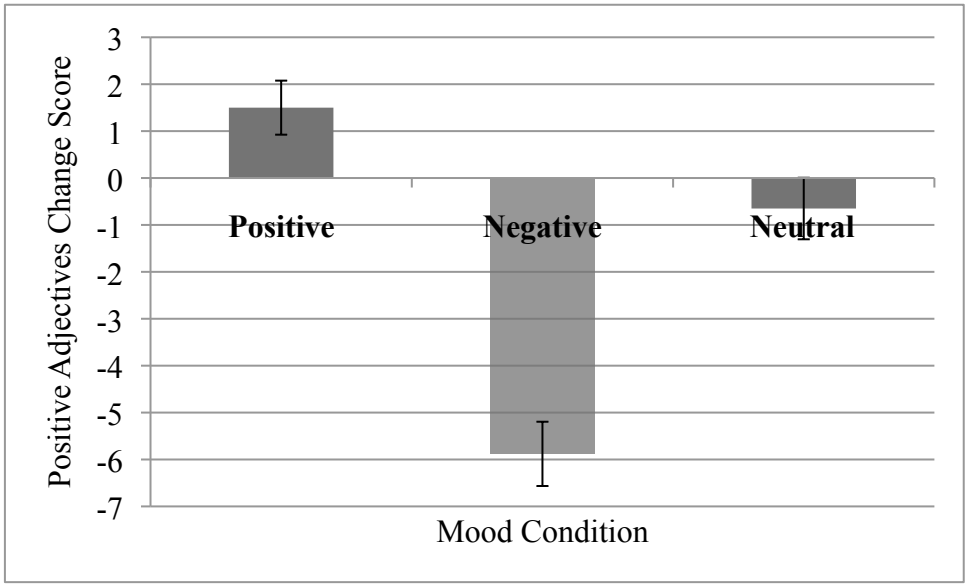


Figure B2. Positive adjective change score (post minus pre)

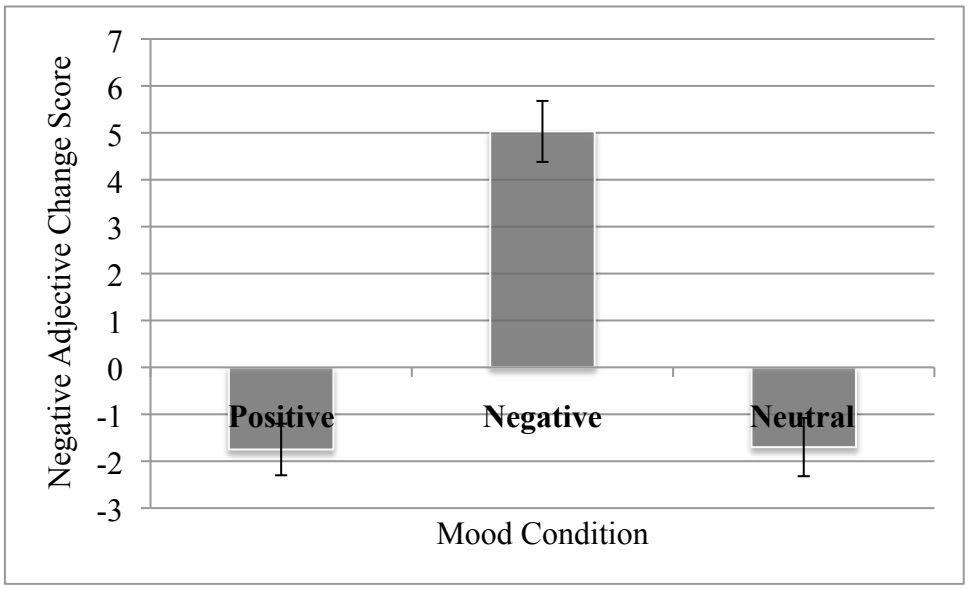


Figure B3. Negative adjective change score (post minus pre)

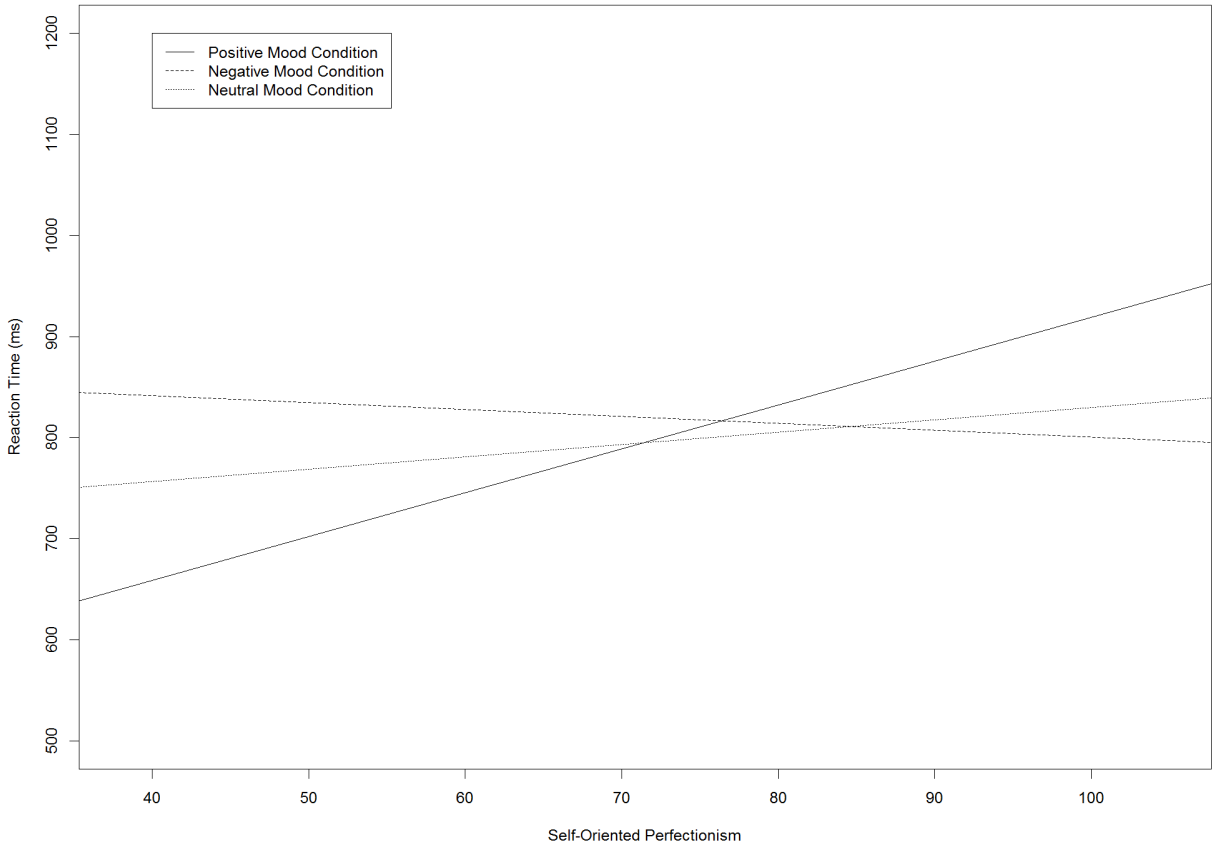


Figure B4. Mood condition x self-oriented perfectionism on neutral emotional Stroop words. The y axis represents reaction time in milliseconds.

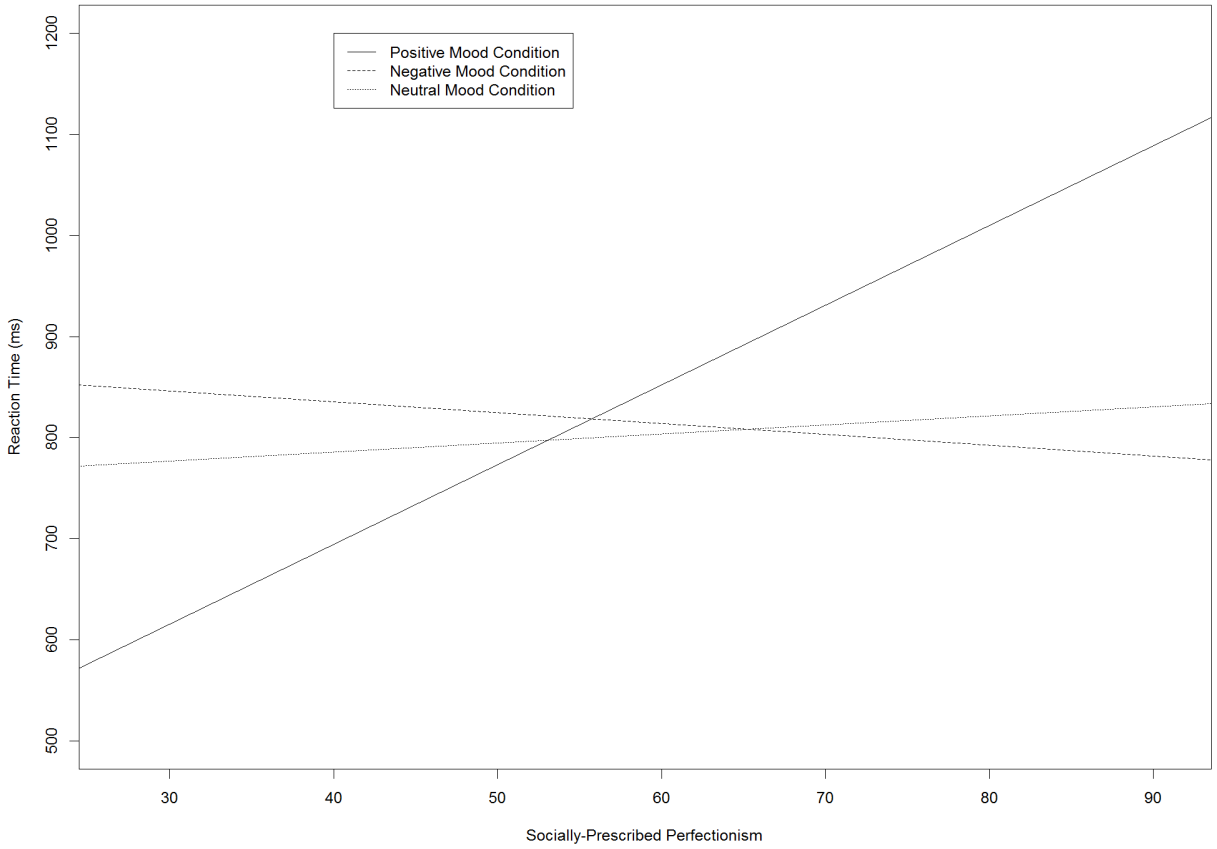


Figure B5. Mood condition x socially-prescribed perfectionism on neutral emotional Stroop words. The y axis represents reaction time in milliseconds.

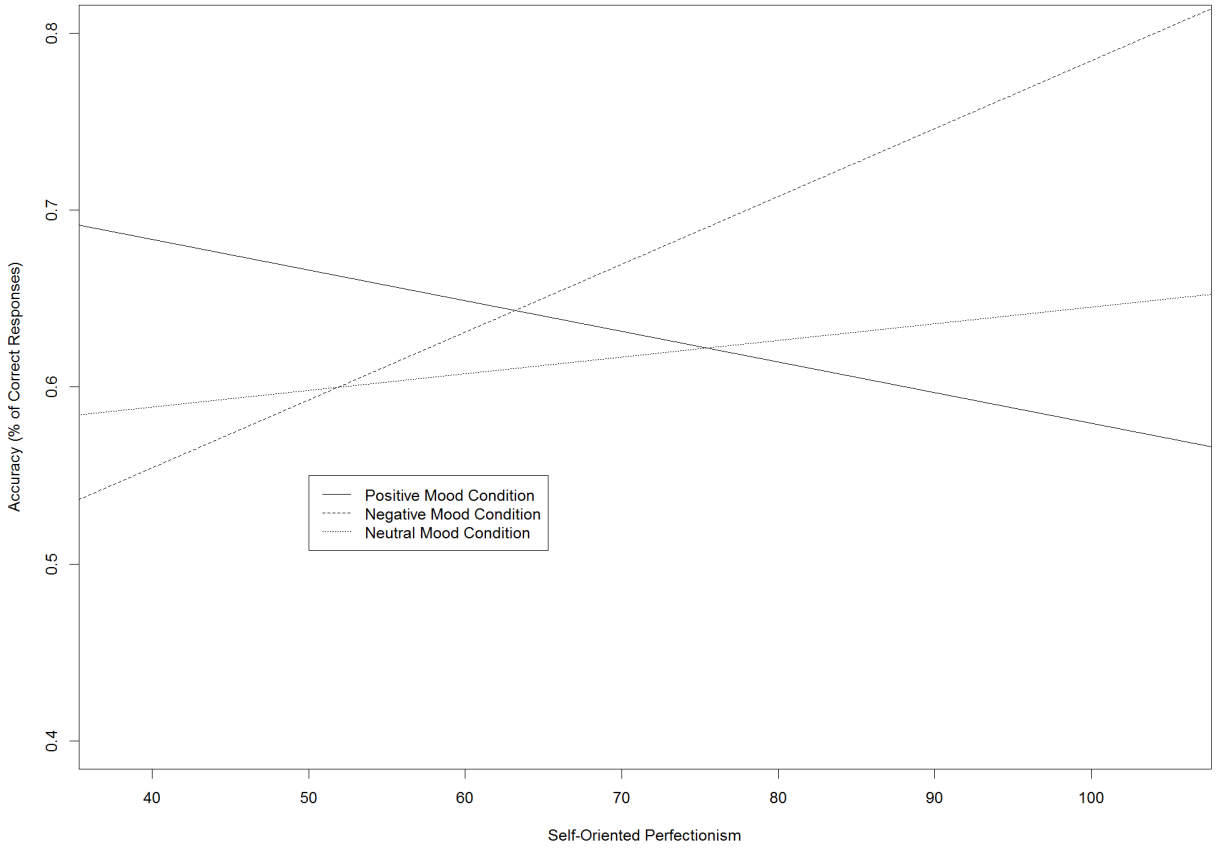


Figure B6. Mood condition x self-oriented perfectionism on perfectionism words on the recognition task. The y axis represents accuracy in percent of correct responses.

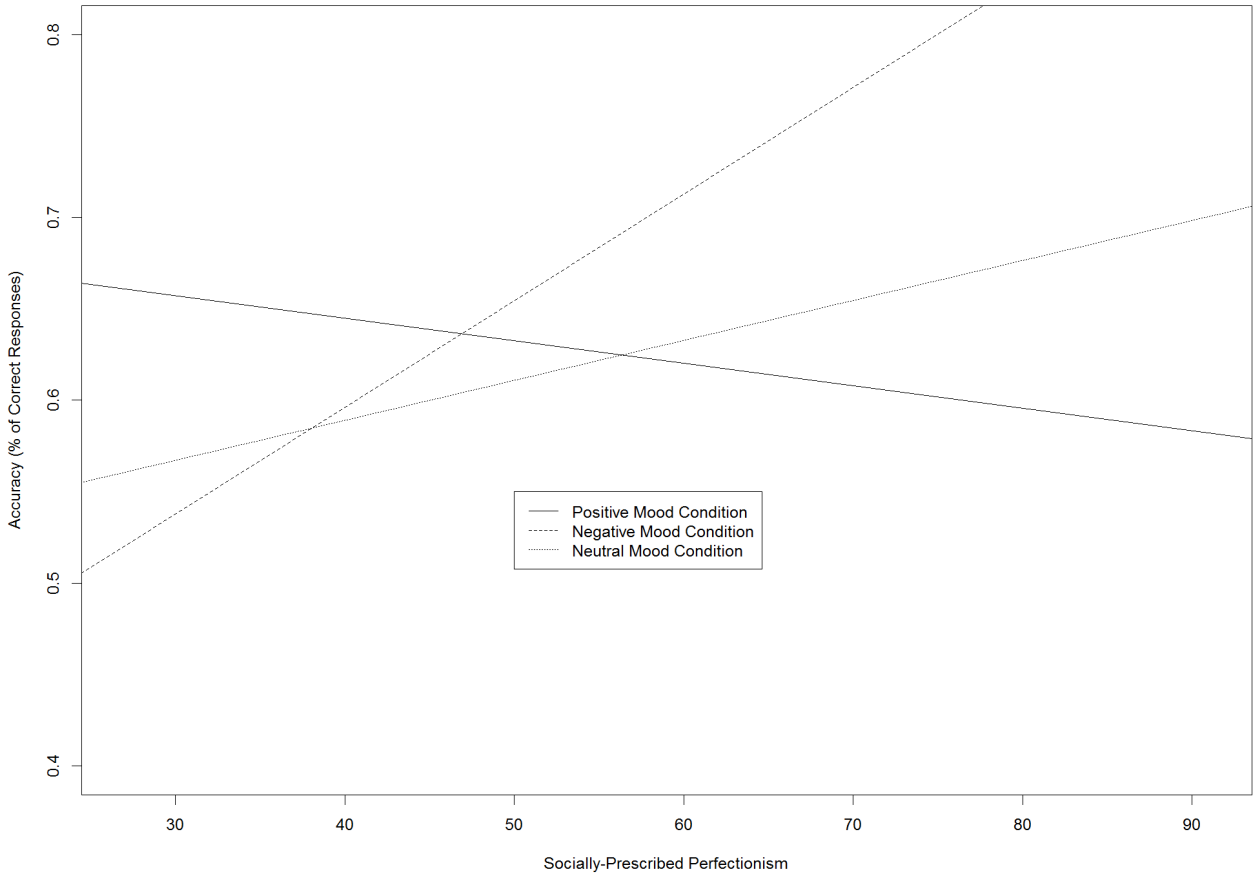


Figure B7. Mood condition x socially-prescribed perfectionism on perfectionism words on the recognition task. The y axis represents accuracy in percent of correct responses.

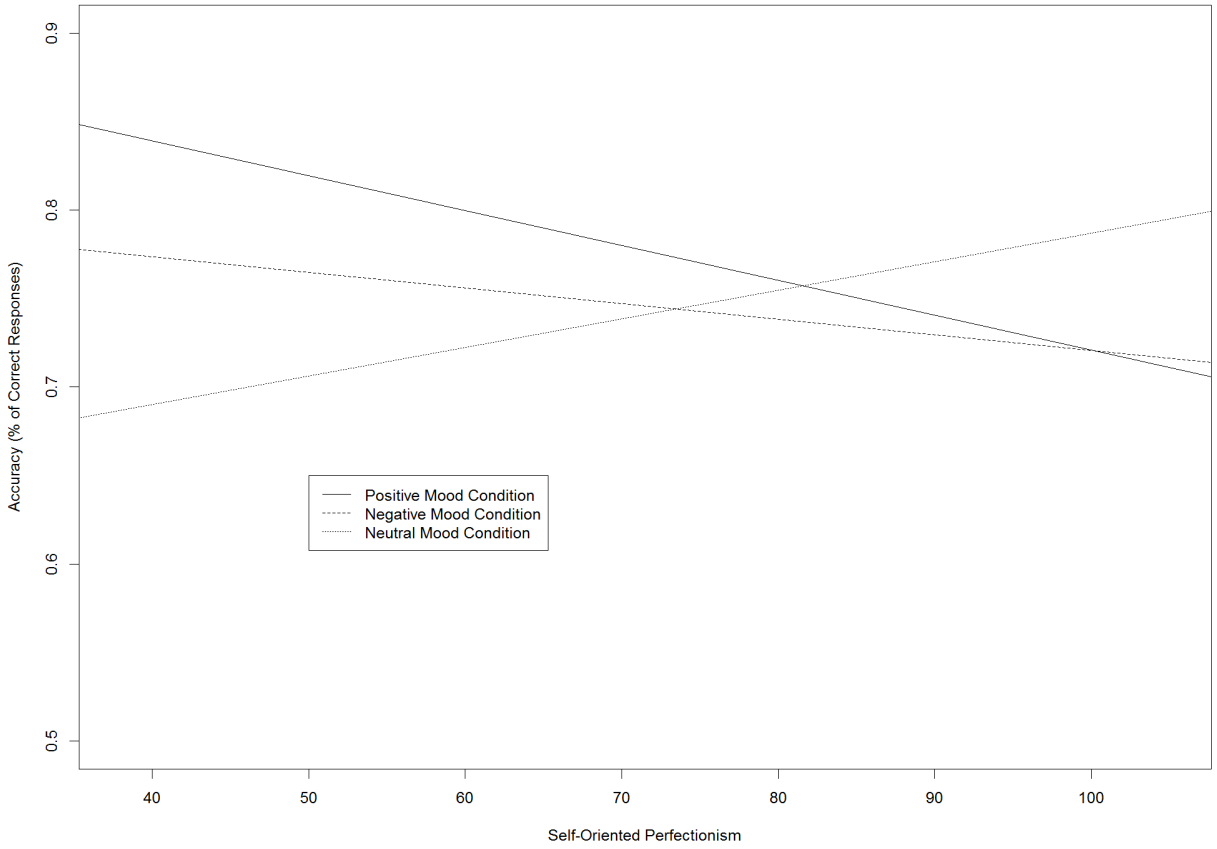


Figure B8. Mood condition x self-oriented perfectionism on neutral words on the recognition task. The y axis represents accuracy in percent of correct responses.

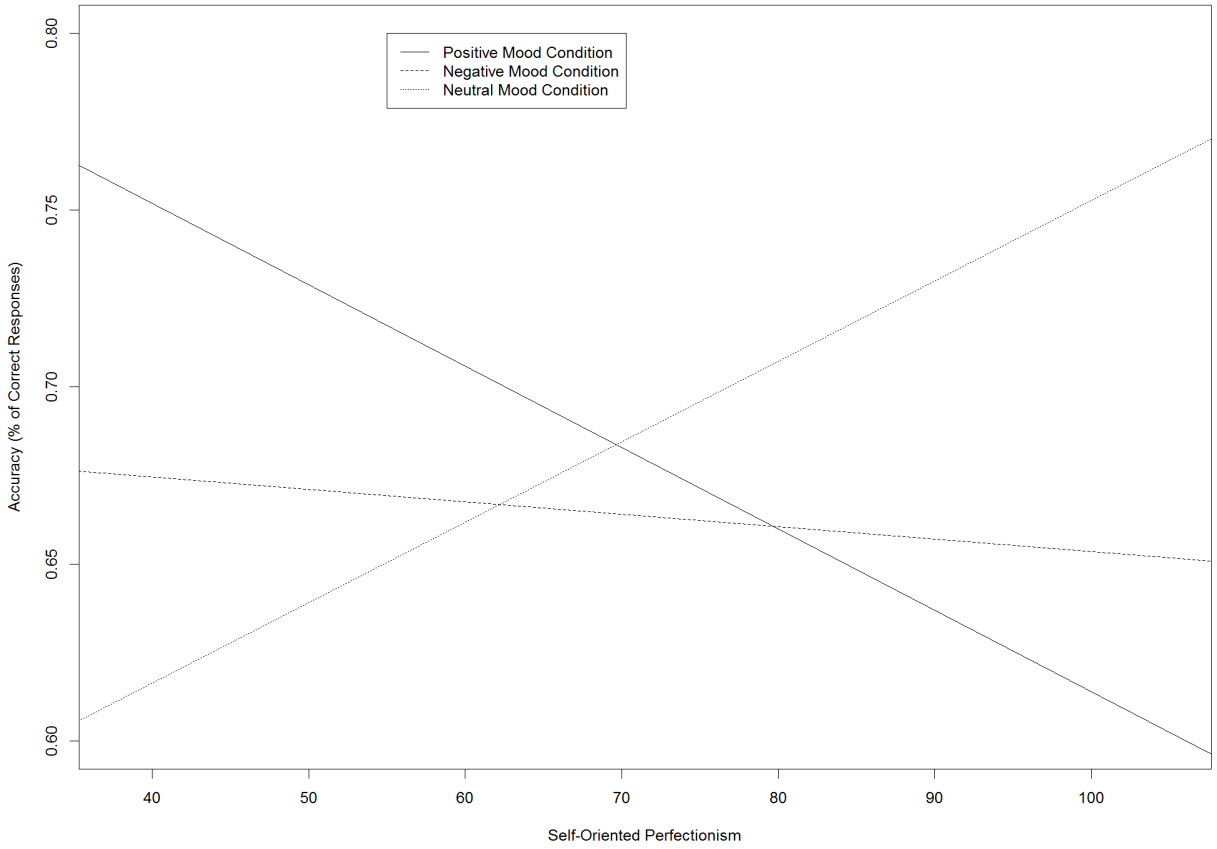


Figure B9. Mood condition x self-oriented perfectionism on positive words on the recognition task. The y axis represents accuracy in percent of correct responses.

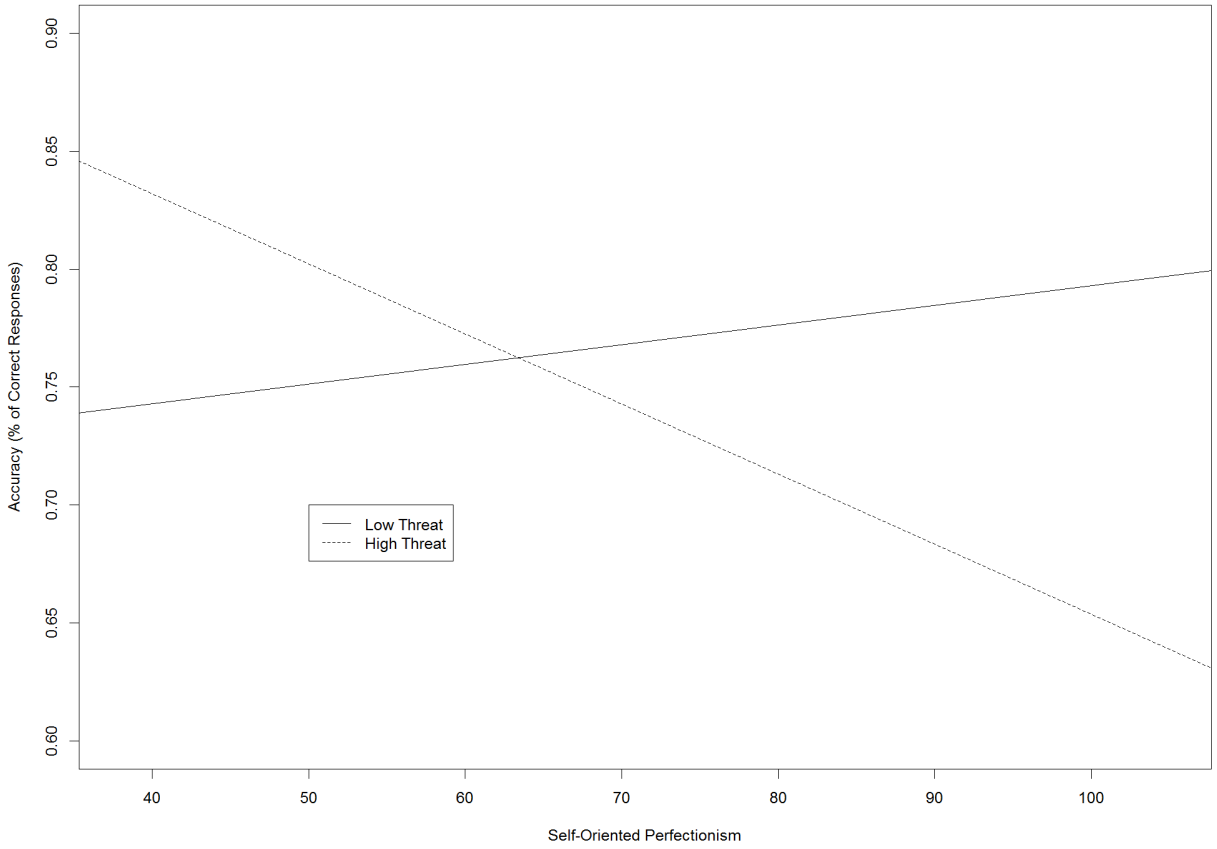


Figure B10. Threat condition x self-oriented perfectionism on neutral words on the recognition task. The y axis represents accuracy in percent of correct responses.

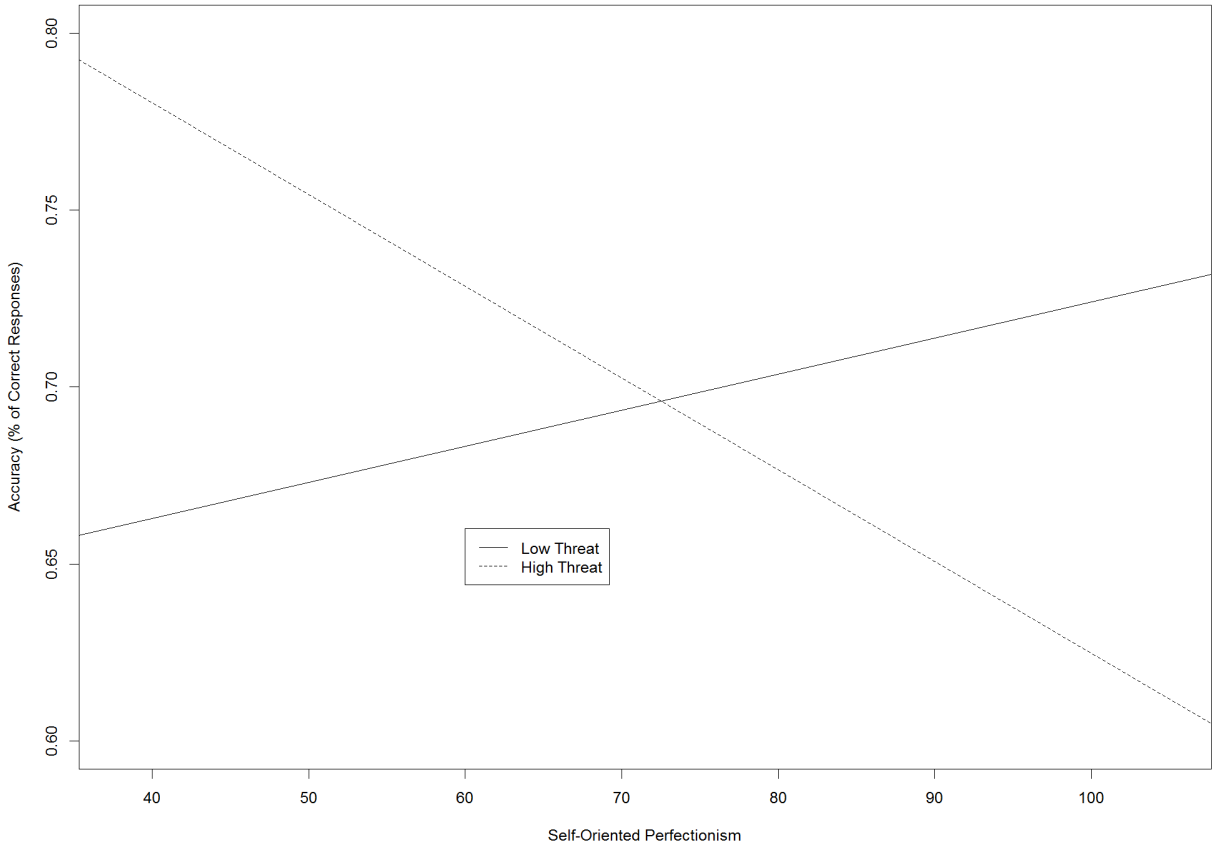


Figure B11. Threat condition x self-oriented perfectionism on negative words on the recognition task. The y axis represents accuracy in percent of correct responses.

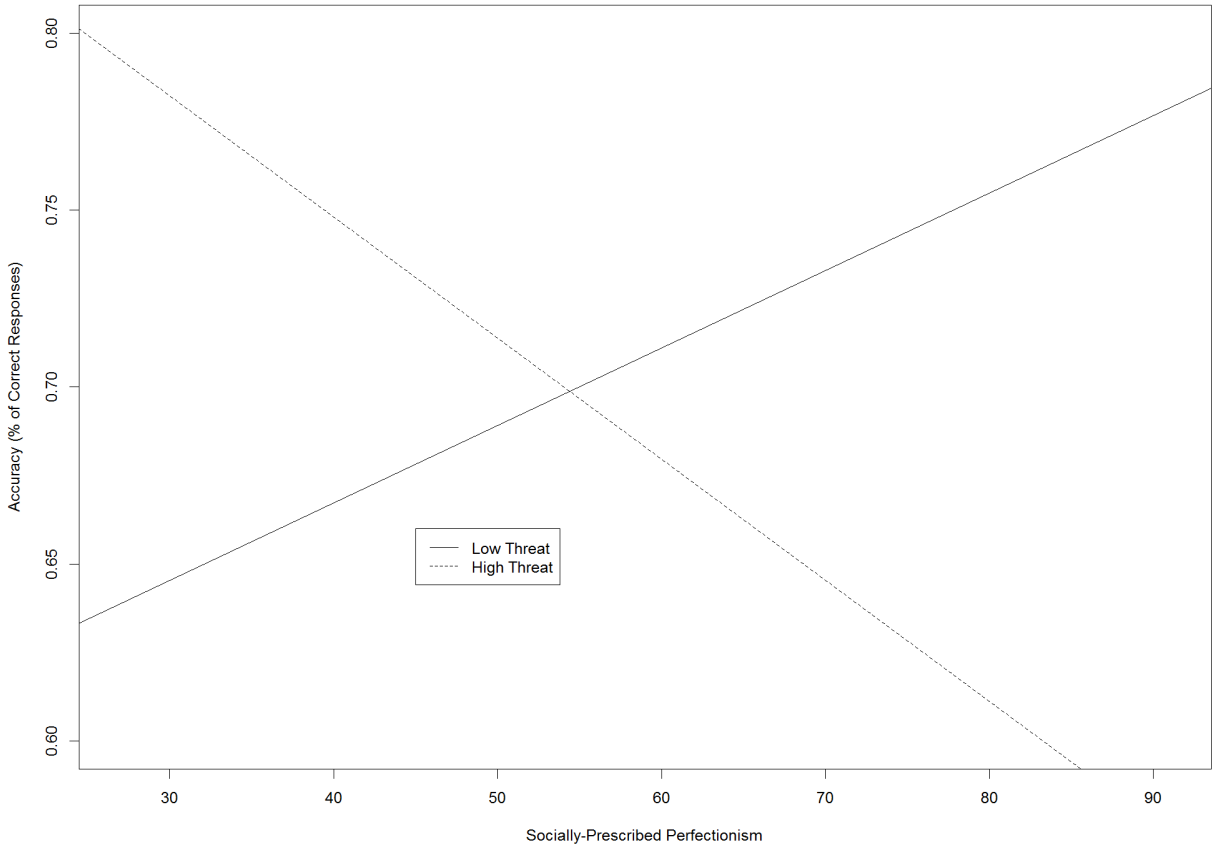


Figure B12. Threat condition x socially-prescribed perfectionism on negative words on the recognition task. The y axis represents accuracy in percent of correct responses.

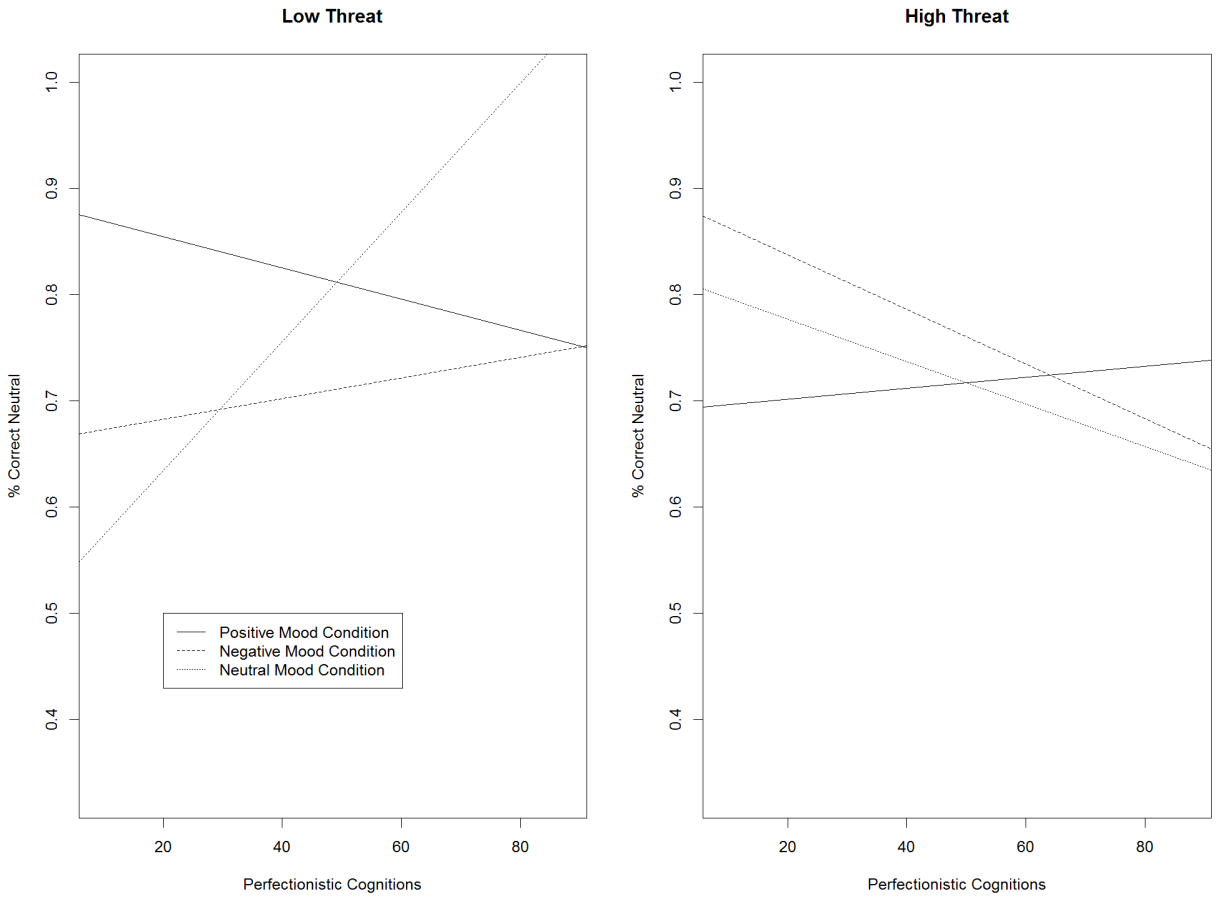


Figure B13. Mood condition x threat condition x perfectionistic cognitions on neutral words on the recognition task**.** The y axis represents accuracy in percent of correct responses.

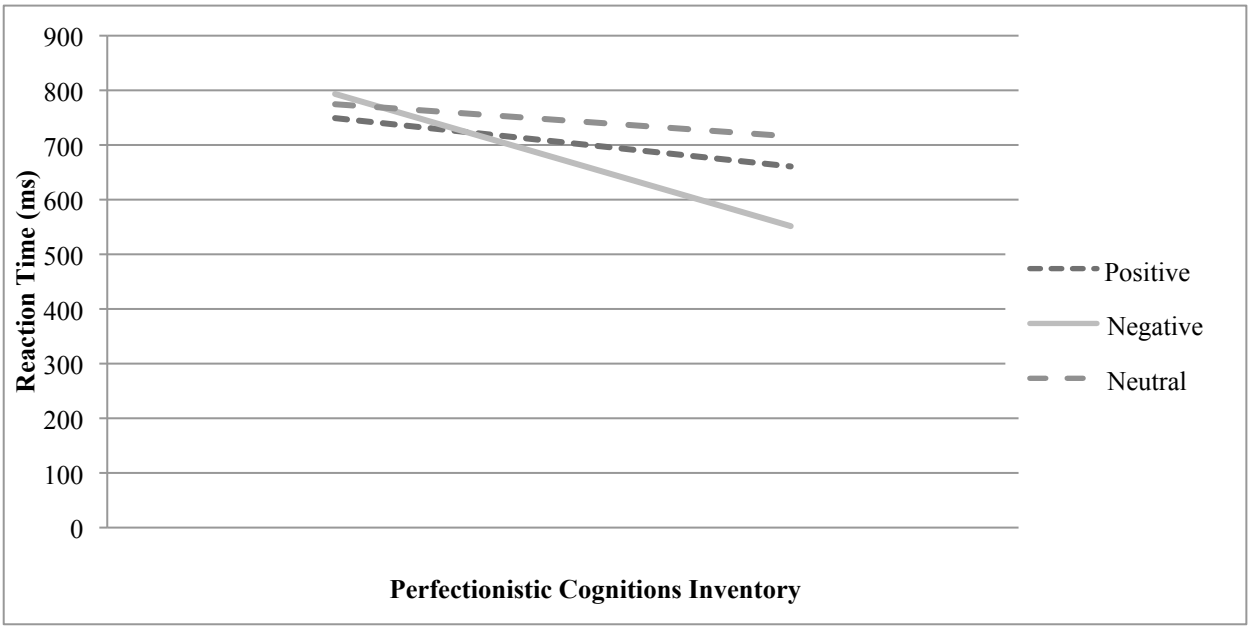


Figure B14. Revised model: Mood condition x perfectionistic cognitions on perfectionism emotional Stroop words**.** The y axis represents reaction time in milliseconds.

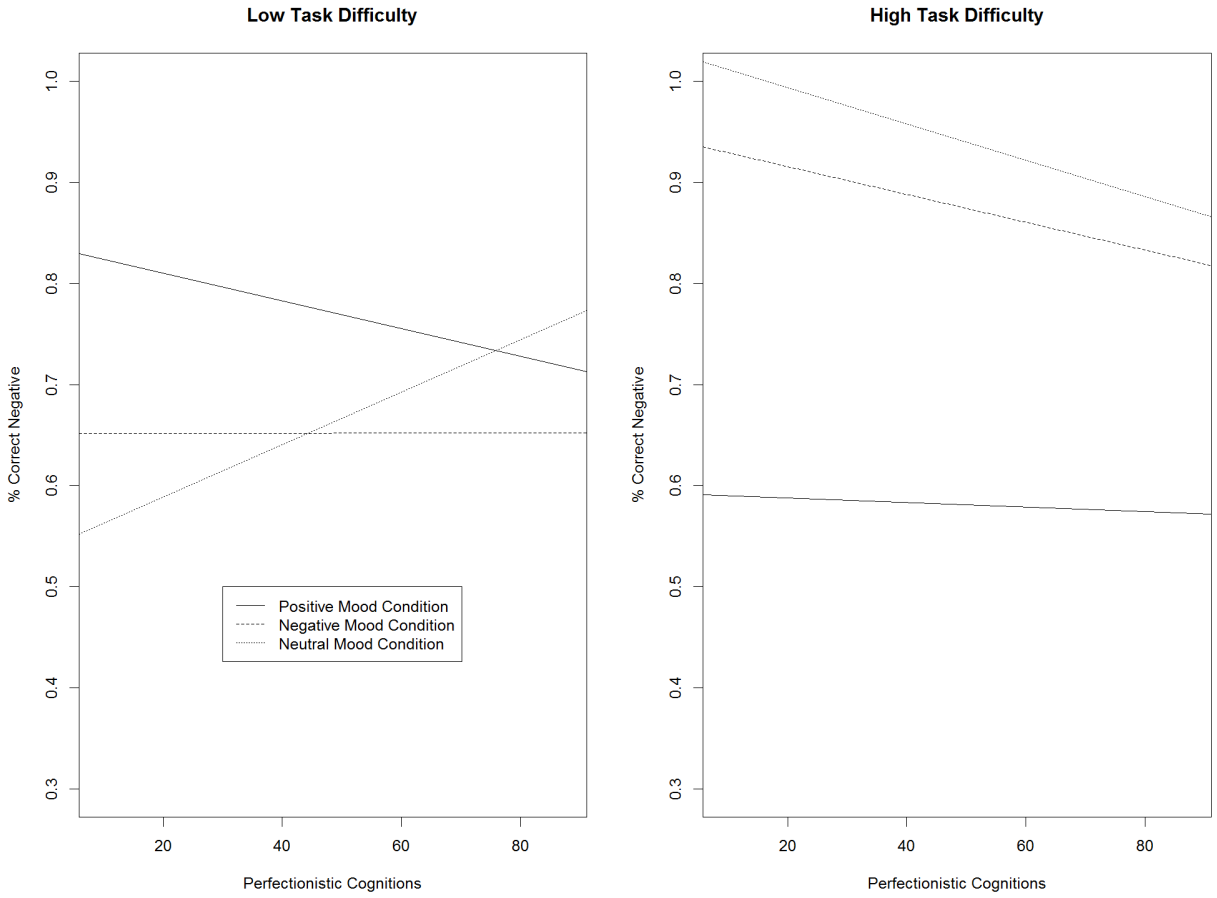


Figure B15. Revised model: Mood condition x threat condition x perfectionistic cognitions on negative words on the recognition task. The y axis represents accuracy in percent of correct responses.

Appendix C: Informed Consent Form

Study Title: Personality and Mood 1A
Investigators: Amanda Desnoyers (B.A. Honours) and Chantal Arpin-Cribbie, PhD

The purpose of this study is to enable a better understanding of personality differences.

The study will take approximately 15 minutes and will involve completing a series of short online questionnaires. Following the questionnaires, you will be eligible to participate in 'Personality and Mood 1B' which you can sign-up for via SONA.

Whereas there are no inherent risks related to participants in the study, some participants may experience slight uneasiness when completing psychological questionnaires or tasks. Should you desire additional support, we are providing you with the contact information for Student Services on the Barrie campus of Georgian College. They are located in room B110 and can be reached by phone at (705) 722 -1523.

Your participation in this study is strictly voluntary. As compensation, if you are an introductory psychology student, you will receive partial course credit of .25% toward the research participation component of your psychology course. Your identity will not in any way be linked to your responses to the study materials. The data collected in this study may be used for publication purposes but will be reported as aggregate data so that individuals could not be identified. Please note that you have the right to discontinue your participation or withdraw your data at any time without penalty by indicating your decision to the researcher. You will still receive your compensation if you choose to withdraw.

If you have any questions about the study, you can contact the researcher Amanda Desnoyers at ax_desnoyers@laurentian.ca, or her supervisor Dr. Chantal Arpin-Cribbie at carpincribbie@laurentian.ca (705–728-1968 ext. 5356).

This study has been approved by the Research Ethics Board of both Laurentian University and Georgian College. If you have any concerns about your participation in the study, you can contact the Research Ethics Board at (ethics@laurentian.ca) at the Laurentian Main Campus and the Research Ethics Board Chair at Georgian College, Dr. Richard Rinaldo at 705-728-1968 ext. 5583 (rrinaldo@georgianc.on.ca).

I agree to participate in this study, and I have received a copy of this consent form.

_____
Participant Name (Please Print)

_____ _____
Participant's Signature Date

Thank you in advance for your consideration.

Informed Consent Form

Study Title: Personality and Mood 1B
Investigators: Amanda Desnoyers (B.A. Honours) and Chantal Arpin-Cribbie, PhD

The purpose of this study is to enable a better understanding of personality differences. More specifically, this study seeks to examine how personality differences and mood states might affect memory and attentional processes in individuals.

The study will take approximately 35 minutes and will involve completing a series of short questionnaires on a computer. Following the questionnaires, you will be asked to view a short video clip. You will also be asked to complete a brief memory task and two brief attention tasks. At the end of the study, you will be fully informed on the specific hypotheses of the study and will have the opportunity to ask questions. This typically takes no more than 2 to 3 minutes.

Whereas there are no inherent risks related to participants in the study, some participants may experience slight uneasiness when completing psychological questionnaires or tasks. Should you desire additional support, we are providing you with the contact information for Student Services on the Barrie campus of Georgian College. They are located in room B110 and can be reached by phone at (705) 722 -1523.

Your participation in this study is strictly voluntary. As compensation, if you are an introductory psychology student, you will receive partial course credit of .75% toward the research participation component of your psychology course. Your identity will not in any way be linked to your responses to the study materials. The data collected in this study may be used for publication purposes but will be reported as aggregate data so that individuals could not be identified. Please note that you have the right to discontinue your participation or withdraw your data at any time without penalty by indicating your decision to the researcher. You will still receive your compensation if you choose to withdraw.

If you have any questions about the study, you can contact the researcher Amanda Desnoyers at ax_desnoyers@laurentian.ca, or her supervisor Dr. Chantal Arpin-Cribbie at carpincribbie@laurentian.ca (705–728-1968 ext. 5356).

This study has been approved by the Research Ethics Board of both Laurentian University and Georgian College. If you have any concerns about your participation in the study, you can contact the Research Ethics Board at (ethics@laurentian.ca) at the Laurentian Main Campus and the Research Ethics Board Chair at Georgian College, Dr. Richard Rinaldo at 705-728-1968 ext. 5583 (rrinaldo@georgianc.on.ca).

I agree to participate in this study, and I have received a copy of this consent form.

_____
Participant Name (Please Print)

_____ _____
Participant's Signature Date

Thank you in advance for your consideration.

Appendix D: Debriefing Form 1A

Study Title: Personality and Mood 1A
Investigators: Amanda Desnoyers (B.A. Honours) and Dr. Chantal Arpin-Cribbie

The online questionnaires that you completed assessed perfectionism and intrusive thoughts.

The current study seeks to clarify the difference between two competing theories of perfectionism. Specifically, the current study examines whether or not perfectionism can be considered solely a maladaptive personality construct as previously suggested by Hewitt and Flett (1991) or whether or not perfectionism contains both an adaptive as well as maladaptive component as Chang (2006) has suggested. In order to understand whether or not a difference does exist you were presented with two different perfectionism measures, one that conceptualizes perfectionism as containing solely a maladaptive component and one that conceptualizes perfectionism as containing both an adaptive and maladaptive component. This was done in order to understand whether or not a relationship does in fact exist between these two measures. It is the hope of the current study that by gathering normative data with regards to indices of perfectionism, it would help to clarify the current debate between whether or not perfectionism can be considered to be an adaptive as well as maladaptive personality variable. In addition to completing the perfectionism measures, you were also asked to complete a measure that looked at intrusive thoughts. This was presented to examine whether or not individuals differ in regards to intrusive thoughts and whether or not this difference relates to maladaptive versus adaptive perfectionism.

Participants can sometimes experience some uneasiness when completing psychological questionnaires. Should you desire additional support, we are providing you with the contact information for Student Services on the Barrie campus of Georgian College. They are located in room B110 and can be reached by phone at (705) 722 -1523.
If you have any questions about the study, you can contact the researcher at ax_desnoyers@laurentian.ca or my supervisor Dr. Chantal Arpin-Cribbie at carpincribbie@laurentian.ca (705–728-1968 ext. 5356).

This study has been approved by the Research Ethics Board of both Laurentian University and Georgian College. If you have any concerns about your participation in the study, you can contact the Ethics Officer, Laurentian University, 705 675 1151 ext. 2436 or 1-800-461-4030 (ethics@laurentian.ca) at the Laurentian Main Campus and the Research Ethics Board Chair at Georgian College, Dr. Richard Rinaldo at 705-728-1968 ext. 5583 (rrinaldo@georgianc.on.ca).

Many thanks once again for your participation.

Debriefing Form 1B

Study Title: Personality and Mood 1B
Investigators: Amanda Desnoyers (B.A. Honours) and Dr. Chantal Arpin-Cribbie

The questionnaires that you completed at the start of the study assessed perfectionism, affect intensity and intrusive thoughts. The movie clip you watched was utilized in order to induce a particular mood within participants. Some participants were asked to view a clip from "Sophie's Choice" which was intended to induce negative mood while other participants were asked to view a clip from "Happy Feet" intended to induce positive mood. Additionally, some participants were asked to view a clip from "Alaska's Wild Denali" which was intended to induce neutral mood.

You were also asked to complete a series of math problems. Some participants were told that successful completion of this type of problem solving task has been found to relate to other more general indicators of academic success in students while other participants were given no instructions. This particular component was an element of deception in this study. More specifically, while some students were told that the questions were indicative of academic ability neither the easy or difficult questions could actually be used to predict potential academic success in students. The math task was used to either create a threat or no threat experience in participants but it is really important to understand that performance on this task is meaningless with regard to overall academic ability.

One of the main outcomes in this study was attention and was measured using two different tasks. The first task required you to scan each line and cross out all instances of the letter 'd' when it was presented with two dashes placed either above and/or below while ignoring all other letters. The second attention task required you indicate the color ink of the presented word by selecting the appropriate key, all the while ignoring the content (negative, positive, neutral or perfectionistic) of the presented word. These attentional tasks were utilized in order to examine whether or not perfectionism affects attention.

The other main outcome variable in this study was memory and was measured using a task in which you had to remember words that were previously presented. This memory task was utilized in order to examine whether or not perfectionism affects one's memory.

We expect that participant's task performance would be affected based on the amount of cognitive resources that they are able to provide to the task. We are interested in understanding how certain personality characteristics can affect the amount of resources that one can provide to both a memory and attention task and how both differing mood states and threatening situations may play a role. One of the specific hypotheses is that participants who are higher in measures of perfectionism will be slower on the attention and memory tasks and recognize more perfectionistic words when compared to those who score lower in perfectionism. Additionally,

those individuals induced into a negative mood will show greater deficits in attentional processes and recognize more negative words.

These hypotheses are based on research that suggests that certain personality characteristics, such as perfectionism, can affect one's ability to successfully complete a task of memory or a task of attention (Szalma, 2009). Additionally, research has demonstrated that one's mood state can directly impact on the types of information an individual pays attention to and remembers thereby creating an attentional or memory bias (Wadlinger & Isaacowitz, 2006). Previous literature has also argued that when an individual is presented with a situation in which they feel threatened, the amount of cognitive resources they are able to call upon and utilize is limited (Hollis-Sawyer & Sawyer, 2008).

Participants can sometimes experience some uneasiness when completing psychological questionnaires or tasks. Should you desire additional support, we are providing you with the contact information for Student Services on the Barrie campus of Georgian College. They are located in room B110 and can be reached by phone at (705) 722 -1523.
If you have any questions about the study, you can contact the researcher at ax_desnoyers@laurentian.ca or my supervisor Dr. Chantal Arpin-Cribbie at carpincribbie@laurentian.ca (705–728-1968 ext. 5356).

This study has been approved by the Research Ethics Board of both Laurentian University and Georgian College. If you have any concerns about your participation in the study, you can contact the Ethics Officer, Laurentian University, 705 675 1151 ext. 2436 or 1-800-461-4030 (ethics@laurentian.ca) at the Laurentian Main Campus and the Research Ethics Board Chair at Georgian College, Dr. Richard Rinaldo at 705-728-1968 ext. 5583 (rrinaldo@georgianc.on.ca).

Many thanks once again for your participation.

Appendix E: Recruitment Script

ONLINE DESCRIPTION

STUDY TITLE: PERSONALITY AND MOOD 1A

The purpose of this study is to enable a better understanding of personality differences. For this study, you will be asked to complete a series of short online questionnaires .The study will take no more than 15 minutes to complete and you will receive partial course credit of .25%. Following the questionnaires, you will be eligible to participate in 'Personality and Mood 1B' which you can sign-up for via SONA. You will be asked to give consent prior to completing both 'Personality and Mood 1A and 1B'. This study is being conducted by Amanda Desnoyers and supervised by Dr. Chantal Arpin-Cribbie.

ONLINE DESCRIPTION

STUDY TITLE: PERSONALITY AND MOOD 1B

The purpose of this study is to enable a better understanding of personality differences. More specifically, this study seeks to examine how personality differences and mood states might affect memory and attentional processes in individuals. For this study, you will be asked to complete a series of short questionnaires on a computer in the Psychology Research Lab (C310S). Following the questionnaires, you will be asked to view a short video clip and then complete a brief memory and two brief attention tasks. The study will take approximately 35 minutes to complete and you will receive partial course credit of .75%. You will be asked to give consent prior to completing both 'Personality and Mood 1A and 1B'.This study is being conducted by Amanda Desnoyers and supervised by Dr. Chantal Arpin-Cribbie.

Appendix F: Multidimensional Perfectionism Scale (MPS)

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you strongly agree, circle 7; if you strongly disagree, circle 1; if you feel somewhere in the between, circle any of the numbers between 1 and 7. If you feel neutral or undecided, the midpoint is 4.

1. When I am working on something, I cannot relax until it is perfect.
2. I am not likely to criticize someone for giving up too easily.
3. It is not important that the people I am close to are successful.
4. I seldom criticize my friends for accepting second best.
5. I find it difficult to meet others' expectations of me.
6. One of my goals is to be perfect in everything I do.
7. Everything that others do must be top-notch quality.
8. I never aim for perfectionism in my work.
9. Those around me readily accept that I can make mistakes too.
10. It doesn't matter when someone close to me does not do their absolute best.
11. The better I do, the better I am expected to do.
12. I seldom feel the need to be perfect.
13. Anything I do that is less than excellent will be seen as poor work by those around me.
14. I strive to be as perfect as I can be.
15. It is very important that I am perfect in everything I attempt.
16. I have high expectations for the people who are important to me.
17. I strive to be the best at everything I do.
18. The people around me expect me to succeed at everything I do.
19. I do not have very high standards for those around me.
20. I demand nothing less than perfection of myself.
21. Others will like me even if I don't excel at everything.
22. I can't be bothered with people who won't strive to better themselves.
23. It makes me uneasy to see an error in my work.
24. I do not expect a lot from my friends.
25. Success means that I must work even harder to please others.
26. I cannot stand to see people close to me make mistakes.
27. If I ask someone to do something, I expect it to be done flawlessly.
28. I am perfectionistic in setting my goals.
29. The people who matter to me should never let me down.
30. Others think I am okay, even when I do not succeed.
31. I feel that people are too demanding of me.
32. I must work to my full potential at all times.
33. Although they may not show it, other people get very upset with me when I slip up.
34. I do not have to be the best at whatever I am doing.
35. My family expects me to be perfect.
36. I do not have very high goals for myself.
37. My parents rarely expected me to excel in all aspects of my life.
38. I respect people who are average.
39. People expect nothing less than perfection from me.
40. I set very high standards for myself.
41. People expect more from me than I am capable of giving.
42. I must always be successful at school or work.
43. It does not matter to me when a close friend does not try their hardest.

44. People around me think I am still competent even if I make a mistake.
45. I seldom expect others to excel at whatever they do.

Appendix G: Perfectionistic Cognitions Inventory (PCI)

Listed below are a variety of thoughts about perfectionism that sometimes pop into people's heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you *over the last week.* Please read each item carefully and circle the appropriate number, using the scale below.

0 = Not at all 1=Sometimes 2=Moderately often 3= Often 4 = All of the time

1. Why can't I be perfect?
2. I need to do better.
3. I should be perfect.
4. I should never make the same mistake twice.
5. I've got to keep working on my goals.
6. I have to be the best.
7. I should be doing more.
8. I can't stand to make mistakes.
9. I have to work hard all the time.
10. No matter how much I do, it's never enough.
11. People expect me to be perfect.
12. I must be efficient at all times.
13. My goals are very high.
14. I can always do better, even if things are almost perfect.
15. I expect to be perfect.
16. Why can't things be perfect?
17. My work has to be superior.
18. It would be great if everything in my life were perfect.
19. My work should be flawless.
20. Things are seldom ideal.
21. How well am I doing?
22. I can't do this perfectly.
23. I certainly have high standards.
24. Maybe I should lower my goals.
25. I am too much of a perfectionist.

Appendix H: Affect Intensity Measure (AIM)

The following questions refer to emotional reactions to typical life-events. Please indicate how YOU react to
these events by placing a number from the following scale in the blank space preceding each item. Please base your answers on how YOU react, not on how you think others react or how you think a person should react.

NEVER	ALMOST NEVER	OCCASIONALLY	USUALLY	ALWAYS	ALMOST ALWAYS
1	2	3	4	5	6

1. When I accomplish something difficult I feel delighted or elated.
2. When I feel happy it is a strong type of exuberance.
3. I enjoy being with other people very much.
4. I feel pretty bad when I tell a lie.
5. When I solve a small personal problem, I feel euphoric.
6. My emotions tend to be more intense than those of most people.
7. My happy moods are so strong that I feel like I'm in heaven.
8. I get overly enthusiastic.
9. If I complete a task I thought was impossible, I am ecstatic.
10. My heart races at the anticipation of some exciting event.
11. Sad movies deeply touch me.
12. When I'm happy it's a feeling of being untroubled and content rather than being zestful and aroused.
13. When I talk in front of a group for the first time my voice gets shaky and my heart races.
14. When something good happens, I'm usually much more jubilant than others.
15. My friends might say I'm emotional.
16. The memories I like the most are of those times when I felt content and peaceful rather than zestful and enthusiastic.
17. The sight of someone who is hurt badly affects me strongly.
18. When I'm feeling well it's easy for me to go from being in a good mood to being really joyful.
19. "Calm and cool" could easily describe me.
20. When I'm happy I feel like I'm bursting with joy.
21. Seeing a picture of some violent car accident in a newspaper makes me feel sick to my stomach.
22. When I'm happy I feel very energetic.
23. When I receive a reward I become overjoyed.
24. When I succeed at something, my reaction is calm and contentment.
25. When I do something wrong I have strong feelings of shame and guilt.
26. I can remain calm even on the most trying days.
27. When things are going good I feel 'on top of the world'.
28. When I get angry it's easy for me to still be rational and not overreact.
29. When I know I have done something very well, I feel relaxed and content rather than excited and elated.
30. When I do feel anxiety it is normally very strong.
31. My negative moods are mild in intensity.
32. When I am excited over something I want to share my feelings with everyone.
33. When I feel happiness, it is a quiet type of contentment.
34. My friends would probably say I'm a tense or 'high-strung' person.
35. When I'm happy I bubble over with energy.
36. When I feel guilty, this emotion is quite strong.

37. I would characterize my happy moods as closer to contentment than joy.
38. When someone compliments me, I get so happy I could 'burst'.
39. When I am nervous I get shaky all over.
40. When I am happy the feeling is more like contentment and inner calm than one of exhilaration and excitement.

Appendix I: Thought Suppression Inventory (TSI)

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you strongly agree, circle 5; if you strongly disagree, circle 1; if you feel somewhere in the between, circle any of the numbers between 1 and 5.

1. I have many unpleasant thoughts.
2. I have thoughts which I would rather not have
3. I experience many emotions that are too intense to control.
4. I regularly 'hear' unexplainable things inside my head, such as my own voice, or the voices of people who are not present.
5. I am unable to concentrate.

Appendix J: Sample Word Lists used for both Emotional Stroop and Word Recognition Tasks

Perfectionistic

1. Precise	2. Demanding
3. Competitive	4. Persevering
5. Picky	6. Complete
7. Orderly	8. Exacting
9. Organized	10. Driven
11. Flawless	12. Diligent
13. Exceptional	14. Ambitious
15. Strict	16. Achieving
17. Imperfect	18. Proper
19. Thorough	20. Critical

Positive

1. Happy	2. Amusing
3. Calm	4. Friendly
5. Energetic	6. Pleasant
7. Relaxed	8. Courageous
9. Decisive	10. Wonderful
11. Enthusiastic	12. Enjoyable
13. Carefree	14. Cheerful
15. Excite	16. Contented
17. Gaiety	18. Certain
19. Courteous	20. Polite

Negative

1. Embarrassed	2. Terrible
3. Depressed	4. Desperate
5. Pain, suffering	6. Rejected
7. Stupid	8. Hesitant
9. Sad	10. Testy
11. Sadness	12. Horrible
13. Miserable	14. Worried
15. Tragedy	16. Guilt
17. Lonely	18. Fragile
19. Tense	20. Hostile

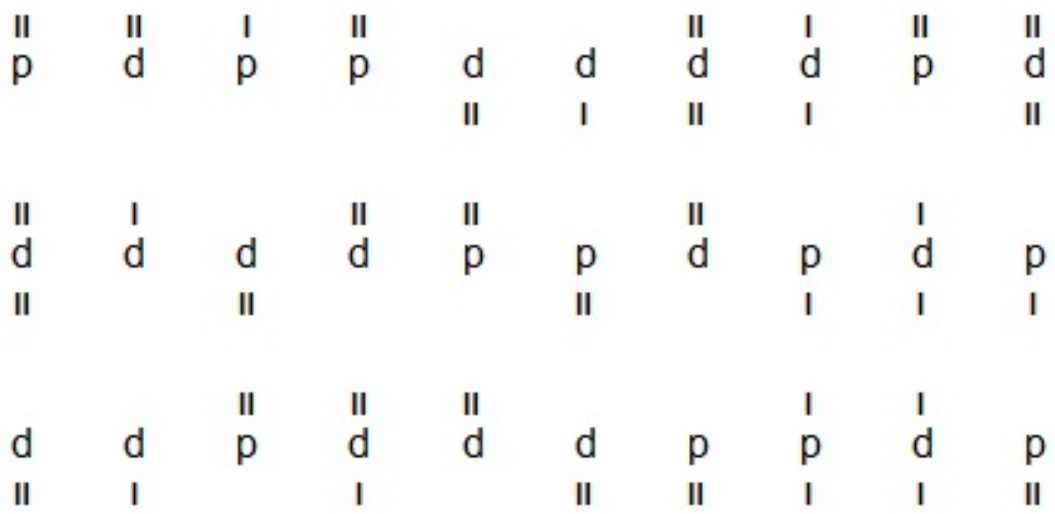
Neutral

1. Butter	2. Factory
3. Guest, visitor	4. Liquid
5. Pianist	6. Wagon
7. Vitamin	8. Cheetah
9. Shirt	10. Dollar
11. Orange	12. Car
13. Swimming-pool	14. Table
15. Cake	16. Computer
17. Lamp	18. Linen
19. Elections	20. Green

Appendix K: Example of the Emotional Stroop

DEMANDING
HAPPY
TERRIBLE
BUTTER

Appendix L: Example of the d2 Test of Attention



Appendix M: Example of the Math Questions used for Threat Conditions

Low Threat Sample Question

The ticket prices to a play are $5.00 for teachers and $3.00 for students. How much will it cost for a group of 71 students and 5 teachers to see the play?

A.$228.00

B.$238.00

C.$370.00

D.$380.00

High Threat Sample Question

A golf ball travelling with a velocity of 212 km/h towards the west encounters a wind blowing north with a velocity of 15 km/h. What is the resultant bearing of the golf ball?

A.[266°]

B.[274°]

C.[285°]

D.[355°]

Appendix N: UWIST Mood Adjective Checklist

Below you will find a list of adjectives. Please rate each one based on how you are currently feeling using the following scale.

0 – not very much 6 – very much

1. Cheerful
2. Contented
3. Satisfied
4. Happy
5. Dissatisfied
6. Depressed
7. Sad
8. Sorry

Visual Analogue Scale

Please rate your current mood ranging from -10 to +10 by marking an "X" on the line below.

Appendix O: Demographic Questionnaire

1. Please indicate the last four digits of your student number.
    a. _____
2. What is your gender?
    a. Male
    b. Female
3. What is your age?
    a. _____
4. What is your intended major or program of study?
    a. _____
5. Are you Part-time or Full-time?
    a. Part-time
    b. Full-time
6. Which year of study are you in?
    a. _____
7. Please indicate your country of origin.
    a. _____
8. Have you ever viewed the previous movie clip before?
    a. Yes
        i. If yes, how many times have you seen it?
            1. _____
    b. No
9. In general, how would you rate your memory on a scale from 1-10?
    a. _____
10. In general, how would you rate your attention on a scale from 1-10?
    a. _____

Appendix P: Indiscriminate Responses Scale

(IRS; Marjanovic, 2009, unpublished scale)

1. To answer this question, please choose number four, "neither agree nor disagree."

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

2. Choose the first option—"strongly disagree"—in answering this question.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

3. To respond to this question, please choose number five, "slightly agree."

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

4. Please answer this question by choosing number two, "disagree."

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

5. In response to this question, please choose number three, "slightly disagree."

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

Note. To boost the effectiveness of IRS-type items, two conditions should be met. First, a statement in the questionnaire's instructions should tell responders that some of the items they are about to answer will be instructional and direct them exactly how to respond. This will prepare responders for the nature of the IRS items which may at first seem strange given they require very different responses than regular personality inventory items. Second, randomly imbedding IRS items in a questionnaire makes them more effective because they are more difficult for responders to visually identify where and when they appear. This maximizes the items' efficacy in identifying random responding